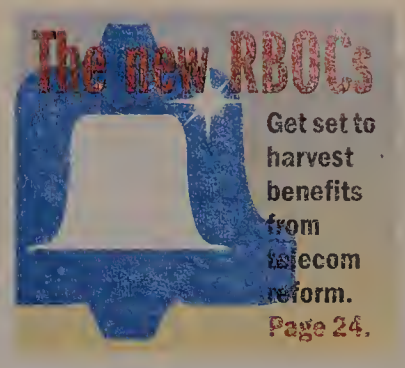
JULY 1, 1996 VOLUME 13, NUMBER 27

NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING



Users to vendors: Give us single logons now

By Christine Burns
San Francisco

The last time the Network Applications Consortium (NAC) issued a call to action, it was for vendors to make directories compatible. Microsoft responded with a directory interoperability technology that even its fiercest rivals pledged to support.

That same user group is now getting ready to make another request. This time, it wants a single logon that lets a user get any

See **NAC,** *page 12*

THE NAC'S ENTERPRISE SECURITY DEMANDS

NOS vendors should:
- Publish all security, directory and messaging APIs and not use proprietary extensions; implement the Generic Security Service API

Application vendors should:
- Move away from proprietary security protocols to support multiple standards and APIs

Users should:
- Quantify authentication problems; include security requirements in RFPs, selecting products that support the widest array of authentication methods

'Net freedom limited abroad

By Chris Nerney
Montreal

In his opening remarks last week to attendees of the INET '96 conference here, Internet Society Chairman Lawrence Landweber said, "It is less important to me that we do business on the Internet than we foster communication [between individuals and societies]."

However, an increasing number of governments around the world instead seem intent on erecting barriers to free speech in cyberspace. They are restricting network access, limiting con-

See **Internet,** *page 10*

Access Network World Fusion using the number in yellow. See page 5 for details.

Tivoli prepped for Powersoft, Notes duties

By Michael Cooney
Austin, Texas

IBM's Tivoli Systems, Inc. unit is prepping high-end management tools to support two important classes of applications — those built with PowerBuilder and Lotus Notes.

According to sources, Powersoft Corp.'s PowerBuilder client/server development tool will be among the first to implement Tivoli's Applications Management Specification (AMS), which will let users more effec-

See **Tivoli,** *page 53*

Grab more info on Network World Fusion, including:
- A copy of the Applications Management Specification
- A look at IBM's plans for enhancing TME 10
- A downloadable copy of the DMI spec

Select News+ then Front Page.

NetworkWorld Fusion
http://www.nwfusion.com

HP touts Web management

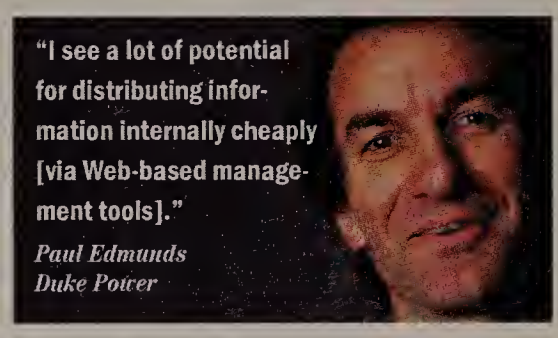
By Jim Duffy
St. Louis

Instead of fighting it, Hewlett-Packard Co. officials last week said the company will embrace the World-Wide Web and use it to bring the OpenView management platform into more accounts.

Some users say the Web diminishes the role of platforms like OpenView. Perhaps in recognition of that, HP is working on Web-based tools to manage networks, and even submitted a proposal to the Internet Engineering Task Force (IETF) for a method to carry management information using HTTP.

HP also used the OpenView Forum conference here last week to show prototypes of Web-based front ends to OpenView applications. In addition, the company said it plans to introduce Web server management tools later this year stemming from its alliance with Netscape Communications Corp.

The moves come at a time when customers are sizing up the Web as a cheaper, more flexible and easier to use interface to network and systems management



data than that provided with OpenView and other popular platforms.

But for some users, HP's efforts are coming too late. Turner Broadcasting System, Inc. (TBS) in Atlanta has already replaced more than two-thirds of its OpenView management con-

See **OpenView,** *page 14*

High-tech vo-techs

No hammers, no welding; just Sniffers and switches

By Charles Bruno

The scarcity of knowledgeable network technicians and expense of educating existing staffers have been perennial problems, but a number of vocational high schools are coming to the rescue.

Schools in cities such as Cincinnati and Philadelphia — and even in rural states such as Oklahoma — are retooling their curriculums to churn out entry-level network technicians. Many are also collaborating with local companies to tailor training programs for their network IS staffs, often at a fraction of the cost of traditional courses.

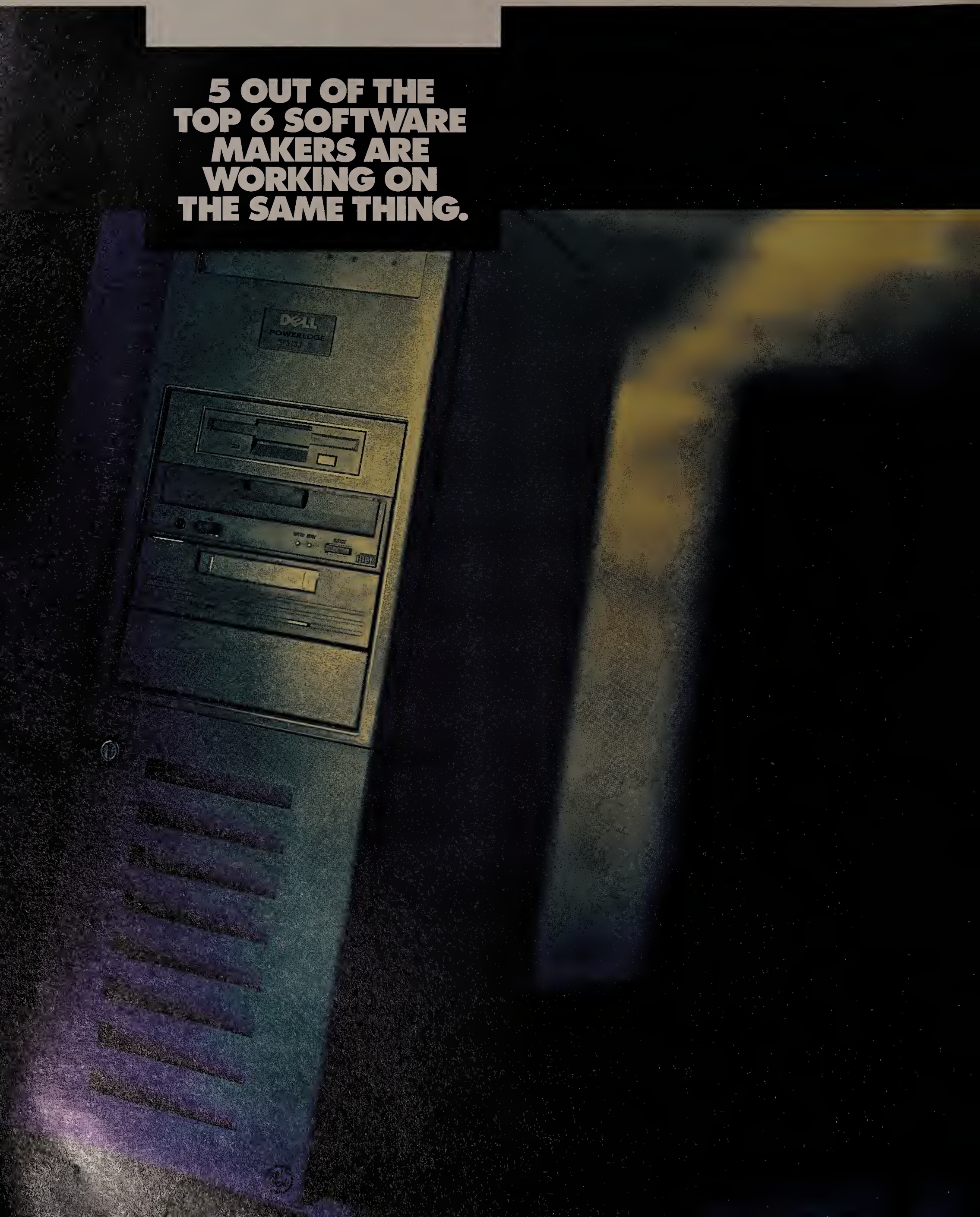
"We are being driven by demand for jobs out in the business community," says Carol Snider Farris, director of Francis Tuttle Vo-Tech's Computer and Business Center.

Francis Tuttle Vo-Tech's *Farris (left) says her institution (above) offers NetWare training and hands-on experience.*

Within the last two years, vocational schools such as Francis Tuttle have begun offering network technician programs heavily steeped in hands-on training. Some schools, such as Great Oaks Institute in Cincinnati, are even expanding youth apprenticeship programs to give students early entry to the job market and allow employers to evaluate students' skills.

See **Vo-tech,** *page 53*

5 OUT OF THE TOP 6 SOFTWARE MAKERS ARE WORKING ON THE SAME THING.



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The Information Highway Is Paved With Rhetoric, Metaphors, And The Scar Tissue Of Misinformed Executives.

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This Week

News+

The Front Page

- **Network management:** Read our front-page story on Hewlett-Packard's proposal to integrate SNMP and HTTP, then download the draft specification.
- **Security:** Some vendors and users are already using the DCE's Security Service for that purpose. Download articles and white papers on the service.
- **Internet censorship:** Link to sites with documents on government attempts to censor the 'Net around the world.

The Technical Sections

- **Middleware:** Grab primers that explain this software and take a look at a comparison of approaches for linking Web servers to legacy apps, in Client/Server Applications.
- **IP switching:** See what's up with the new approach to pushing packets via articles and white papers, in WANs & Internetworking.
- **Networked multimedia:** Tune in for articles and white papers on using ATM to deliver multimedia to the desktop, in Local Networks.
- **Electronic commerce:** Credit Visa, MasterCard and American Express with trying to develop protocols for secure online transactions. Read a white paper and join a mailing list about their proposed protocol, in Intranets & the 'Net.

NetRef

Download the charts from our annual LAN switching guide. Select Technology Resources then Internetworking.

this week's pick

A recent report by the General Accounting Office found the Pentagon ill-prepared to deal with a growing wave of hacking attempts. Read the report for yourself; download a Portable Document Format version at http://www.gao.gov/monthly.list/ai96084.pdf.

HOW TO GET ON TO NETWORK WORLD FUSION

At the welcome screen, click on First Visit and follow the instructions. Subscribers, keep your NWF number – highlighted on the front cover's mailing label – handy during registration. Non-subscribers must fill out an on-line registration form.

NetworkWorld Fusion

CONFERENCE PICK

Hot Topic **What does the future hold for token ring? See what Anu Gurugé says on page 36, then voice your opinion.**

Select Forum, Columnists then The Blue View.

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Unfettered RBOCs are gearing up for new markets, brutal competition.
See page 24.

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Client/Server Applications

Intranets & the 'Net

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COMPARING LAN SWITCH CONTENDERS:

Five categories by which you can judge the players. *Page 39.*

NetworkWorld's *Mission: To provide news and analysis that help network IS professionals deliver the network computing infrastructure and distributed applications required to meet evolving business needs.*

News briefs, July 1, 1996

IBM bonds with Netscape

IBM last week announced plans to market Netscape Communications Corp.'s server software and commercial applications on its AIX platform. Under the plan, IBM's RS/6000 servers can be purchased as a bundled package either with the company's own Internet Connection Secure Server or with Netscape's Enterprise or FastTrack Web servers. Customers also will have the option of bundling in Netscape's Proxy server, which caches frequently accessed Internet documents inside the corporate firewall to help conserve bandwidth and reduce response time. Netscape's Navigator Web browser software, Adobe Systems, Inc.'s Acrobat reader and IBM's Java development tool kit can also be included.

Banking on Digital

Citicorp cracked open its piggy bank and last week said it will hand Digital Equipment Corp. a three-year, $500 million contract for LAN and software support. The contract will include PC hardware, software and networking support. The agreement is a step in Citibank, N.A.'s plan to standardize all Citicorp LANs and desktops on a common hardware and software platform.

Sync ties up Tylink

Sync Research, Inc. agreed last week to buy Tylink Corp., building on the companies' work to integrate Tylink's T-1 data service unit and ISDN modules into Sync's frame relay access devices. The merged company plans three product groups: WAN interworking, digital access and circuit management. Sync paid about $39.2 million in stock plus $4 million in cash.

Marketing exec bids adieu to Compaq

Austin

According to sources, Gene Austin, Compaq Computer Corp.'s vice president of marketing, resigned from the company and was escorted off the Houston campus last week. Analysts said an ongoing reorganization within the sales and marketing side of the Systems Division at Compaq could have been a factor in Austin's departure. He is reportedly headed for an Internet start-up in Virginia.

McAfee to vaccinate Microsoft

McAfee announced last week that is has licensed portions of its antivirus technology to Microsoft Corp. for use in future Internet-related software products. McAfee's virus-scanning technology can identify more than 8,000 viruses.

Battle over free speech goes on

The Communications Decency Act (CDA) could be back. The Justice Department last week said it will file notice by this Tuesday to appeal the Philadelphia District Court's recent decision to overturn the CDA. The Justice Department did not reveal its rationale for seeking to uphold the CDA, which free-speech advocates contend limits freedom of speech on the Internet.

Building a better firewall

Harris Computer Systems Corp. last week said it intends to integrate the Security Dynamics Technologies, Inc. SecurID token authentication technology into its CyberGuard Firewall. Harris is also changing its name to CyberGuard Corp.

In related news, firewall vendor Secure Computing Corp. has signed an agreement to acquire Enigma Logic, Inc., a Concord, Calif.-based provider of token authentication products.

Digital makes 'Net transaction

Digital Equipment Corp. of Maynard, Mass., today will launch its TP Internet Server for secure transaction processing over the Internet. The software integrates Digital's ACMSxp TP monitor with AltaVista Tunnel encryption technology. The product is designed for applications such as financial services and inventory control. Pricing starts at $6,400 for Windows NT Server systems and $14,200 for Digital Unix servers. Client software starts at $192.

FCC orders local number portability

But it won't show up for more than 2 years; RBOCs get 'til end of '98 to meet requirements.

By David Rohde
Washington, D.C.

The Federal Communications Commission last week ordered the nation's local exchange carriers (LEC) to let users keep their telephone numbers if they switch local carriers.

But it may take 2-1/2 years for users to see the benefit because the FCC gave the regional Bell operating companies (RBOC) and other LECs until Dec. 31, 1998, to carry out its mandate in the 100 largest U.S. metropolitan areas.

When implemented, the FCC's order means RBOCs will no longer be able to hold users hostage by laying claim to their phone numbers. Competitive access providers (CAP) have frequently complained that they lose sales when users discover they have to advertise new phone numbers if they switch carriers.

Under the revised rules, RBOCs must do more than merely forward calls to new numbers assigned to CAPs. Such call forwarding has occasionally been used as a number-portability Band-Aid, but users have found that caller ID and other critical data gets lost in the process. Instead, RBOCs must devise a method in which calls to so-called portable numbers take no longer to deliver than other calls, carry equivalent optional services and do not first travel over an RBOC network before being delivered to the correct carrier.

The FCC stopped short of describing how portability should take place. It refused to mandate an AT&T-backed method known as Location Routing Number (LRN) that triggers a database search for number routing instructions. However, FCC officials said LRN meets the portability features it is requiring.

By contrast, an RBOC-backed method known as Query on Release (QOR) fails the FCC test, according to commission attorney Jason Karp. That's because QOR only performs a number-database search if the RBOC discovers it no longer owns the number. As a result, calls to CAP customers take longer to complete than calls to RBOC customers. Some states have allowed RBOCs to implement QOR, Karp added, but the FCC's action means those states will either have to rewrite their rules or defer to the FCC.

TELECOM IN TRANSITION

Did Congress help?

Congress required the FCC to devise number-portability rules when it passed the Telecommunications Act of 1996. Paradoxically, passage of the new law may have actually robbed users of some portability benefits.

When the FCC suggested national portability rules last year, its proposal discussed not only the ability to switch carriers with no number change, but also the ability for users to change service categories and locations with no number change.

WIRELESS LOCAL LOOP GETS A BOOST

In other action, the FCC last week:

- Sought to stimulate wireless local-loop access to public networks by abolishing a requirement that wireless carriers offer fixed services only on an ancillary basis to mobile services.
- Ordered cellular carriers to offer roaming to personal communications services (PCS) subscribers who have dual-mode handsets that work with both cellular and PCS.

But when Congress acted in February, it only mandated portability among carriers. The new law does not let users keep their numbers if they switch from analog to ISDN lines, for example. ■

Network analysis

Network General gets suite on net management and analysis

By Ben Heskett
Menlo Park, Calif.

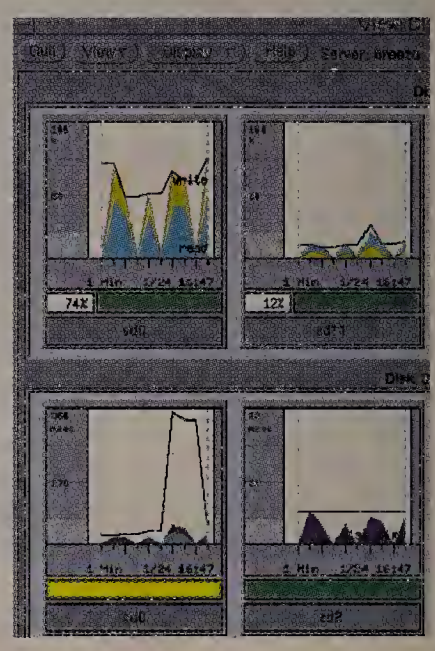
Network General Corp. will roll out a series of enhanced products this week to help customers get a better read on network performance.

The company's Network Visibility Solution Set, its first product suite, will include network performance and analysis tools, server and router management programs, data collection probes and a central database.

"They're expanding the scope of what they traditionally have focused on," added Tom Bain, an analyst with META Group, Inc., a Stamford, Conn.-based consultancy. "But there's still some work to be done to tie these different things together."

Topping the slew of announcements are new features in the Distributed Sniffer System (DSS) 4.0, based on recent enhancements made to Version 5.0 of the base Sniffer

See **Sniffer,** *page 10*



Network General's *SharpShooter 3.0 can display I/O bottlenecks.*

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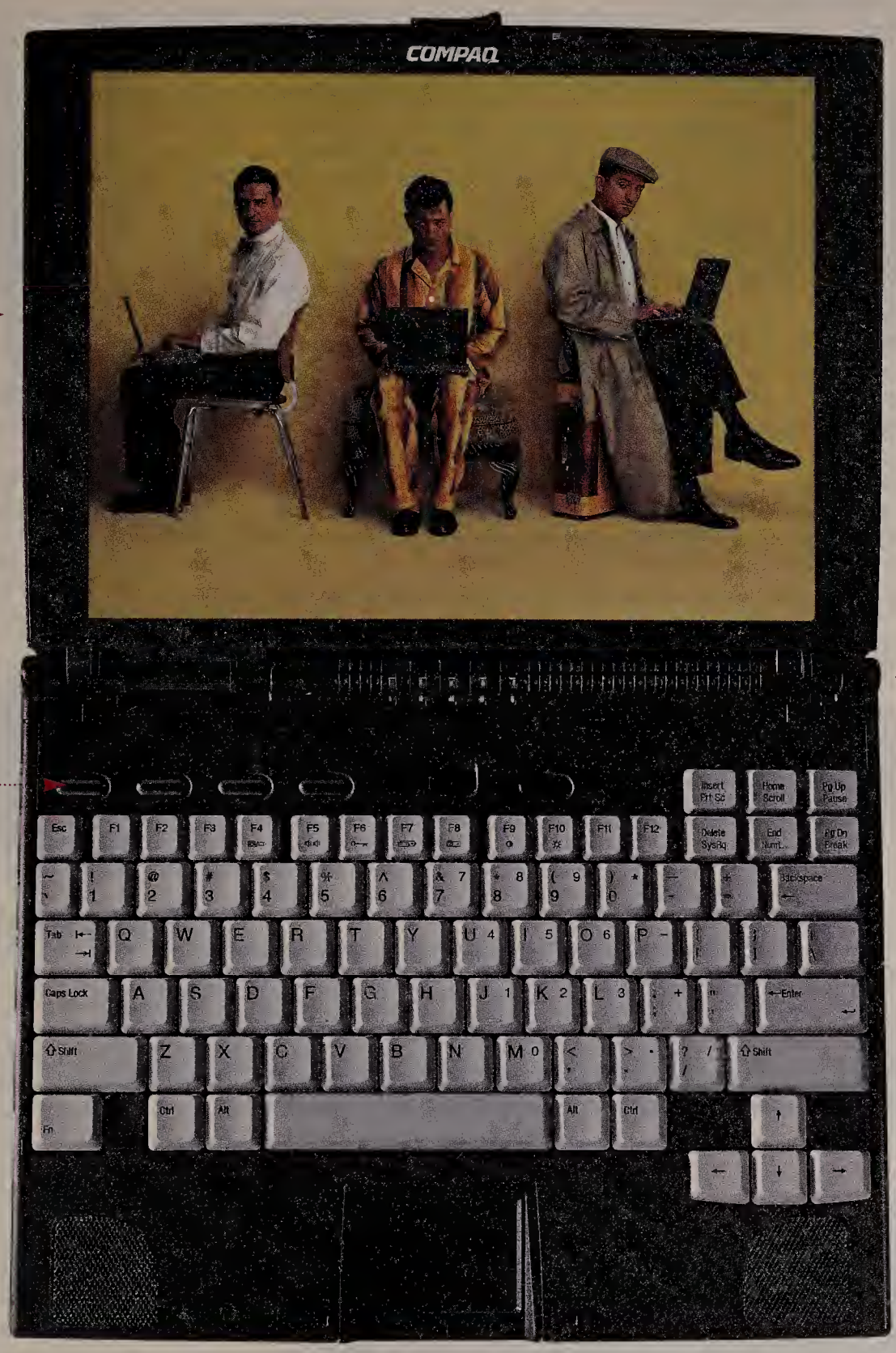

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COMPAQ

Microsoft steps on Exchange mail bugs

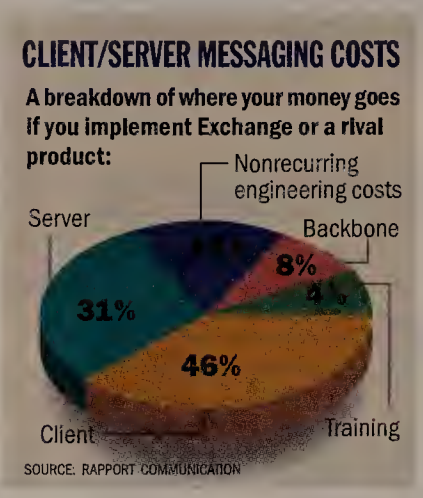
By Barb Cole
Redmond, Wash.

Microsoft Corp. will publish a patch for its Exchange messaging server next week that is expected to remedy some problems associated with routing messages and running the software with the current beta release of Windows NT.

The fix, dubbed Service Pack II, will address bugs that have made routing electronic mail to Exchange through the software's Message Transfer Agent (MTA) problematic.

"There have been a ton of issues with the MTA," said one consultant who is helping a large manufacturing firm migrate about 15,000 users from Lotus Development Corp.'s cc:Mail to Exchange. "Sometimes it just stops working, and it seems to get bogged down by large messages," he said.

Greg Lobdell, group product manager at Microsoft, said that there have been some glitches associated with the MTA, mostly involving E-mail configurations in which messages hop through multiple mail systems.



In addition to solving the MTA problems, the fix will enable users to run Exchange on the Beta 2 release of Windows NT. Previously, incompatibilities between Exchange and the current Windows NT beta (BC) frequently derailed Exchange's Internet Mail Connector, Lobdell said.

Service Pack II will also include the much-anticipated Macintosh client and support for Motorola, Inc. PowerPC hardware, according to Lobdell.

This is the second service pack Microsoft has posted since Exchange shipped in April, and essentially comprises bug fixes already posted free on the Web. The company plans to roll out Exchange 4.1 in the fall, which will focus on improving the Internet support of the messaging system.

Bug reports aside, early adopters are happy with Exchange and are calling it one of Microsoft's best 1.0 efforts. "Most of the things we didn't like or felt were limitations have been aggressively addressed by Microsoft," said Ned Studt, senior systems engineer at the State of Kentucky Department of Education in Frankfort, which has moved about 1,500 users to Exchange. ■

AT&T unit, Industry.Net merge; Manzi in charge

By Joanie Wexler
Cambridge, Mass.

A year ago, Jim Manzi was succumbing to IBM's hostile takeover of Lotus Development Corp. Last week, he was again in the merger-and-acquisition spotlight when the Internet company he joined as CEO earlier this year merged with an AT&T business unit.


Manzi *back in the acquisitions game.*

Under the deal, Manzi's Industry.Net and the AT&T Business Network will become subsidiaries of a new holding company called Nets, Inc., of which he has been named chairman.

Industry.Net is a Web-based electronic mall that hosts product information for 4,500 companies in the manufacturing industry. The privately held firm says 200,000 purchasers use its service.

The AT&T Business Network has been run by AT&T New Media Services and is a business information and news service that moved onto the Web platform last month.

Industry.Net and AT&T New Media Services were short on details about what new services the merger would yield. But they did say that Nets, Inc. would draw on New Media's marketing and customer acquisition expertise to build more networks like Industry.Net to serve other markets.

"AT&T has a channel into millions of businesses" that could bring their wares to a Nets, Inc. mall, noted Greg Wester, a research director of interactive services at The Yankee Group consultancy in Boston.

The new merged company is said to be negotiating with other organizations within AT&T — its Easy Commerce Services and WorldNet 'Net access groups — to add back-end transaction processing systems and 'Net links that would stretch the service's appeal and functionality. ■

Cray makes its Ethernet switches responsive to net conditions

By Jodi Cohen
Annapolis Junction, Md.

Cray Communications last week unveiled software for its Ethernet backbone switch that enables each port to forward packets in the fastest, most reliable mode.

The new adaptive switching feature for Cray's MatchBox Switch configures individual ports based on packet error rates, eliminating the need for network managers to intervene. Typically, all ports on a switch handle traffic in the same way.

A Cray switch equipped with the new software uses built-in Remote Monitoring to determine the type of errors being received on a port and then selects the best combination of performance and error-checking offered by one of three switch forwarding modes.

The cut-through method is fastest since the switch only examines a packet up to its destination address before forwarding it. The drawback is that bad packets are forwarded.

The next-fastest level is fragment-free mode, which holds an Ethernet frame for the first 64 bytes in order to detect any errors without introducing too much latency.

The biggest drain on performance comes from using the store-and-forward method, which filters out error frames by storing the incoming frame before sending it. However, it is the most reliable mode in that it resists propagating bad packets across the LAN.

Most vendors' switches operate in either cut-through or store-and-forward mode, not both. However, Amber Wave Systems, Inc.'s AmberSwitch workgroup device can toggle between forwarding modes. Then again, workgroup products do not need the sophisticated error control that enterprise-level backbone switches require, one analyst said.

"Usually users will want to stick a store-and-forward switch in the backbone to get effective error checking," said Esmerelda Silva, an analyst at International Data Corp., a consultancy in Framingham, Mass.

"But now you can also get the performance benefits [increased speed and lower latency] of cut-through switching on a per-port basis in that same backbone switch," she said.

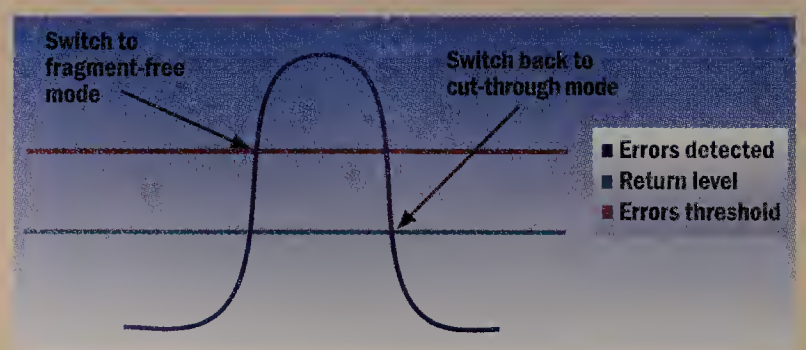
Adaptive switching gives customers a more efficient way of running the switch, said Martin Lund, product marketing manager for switching at Cray. "Instead of forcing all 24 switch ports to run at a slower speed, we focus on the problem port so that we don't affect the performance of the entire box," he said.

Cray's adaptive switching feature will be available this month as a free software upgrade.

© Cray: (800) 227-3134.

Fast-forwarding

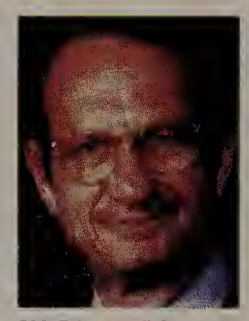
Cray's adaptive switching feature optimizes an individual port's forwarding mode based on the amount of errors detected.



CIA director calls for cyber-war defense center

By Ellen Messmer
Washington, D.C.

The director of the CIA last week said the U.S. will set up a defense center to combat the growing threat of terrorists and criminals out to bring down vital network systems.


CIA *Director John Deutch*

CIA Director John Deutch said the threat of organized information warfare is likely to grow, raising the prospect of an "electronic Pearl Harbor."

In fact, reports are now circulating in Europe and the U.S. that the banking community has already caved in to electronic extortionist gangs.

The Times of London last month ran stories claiming that since 1993, banks in the U.K. have paid millions of dollars in an least four attacks from blackmailers who showed they could crash computer systems at will.

Although skeptics doubt the reports, some experts back the claims. Winn Schwartau, president of security consultancy Interpact, Inc, said two banking officials at the recent International Banking Information Technology Forum in Basel, Switzerland, told him that four banks have together paid the equivalent of $100 million to cyber-bandits who brought down computer systems.

Another security expert, who asked for anonymity, claimed that one bank branch in Cornwall, England had its teller terminals and CRT screen blanked out or garbled for three days by bandits who pointed High-Energy Radio Frequency (HERF) devices at them. Microwave-based HERF guns were developed by the military to disrupt computer systems.

The security expert also said he was now at a Las Vegas casino, where he is investigating what appears to be an HERF attack by cyber-bandits there. ■

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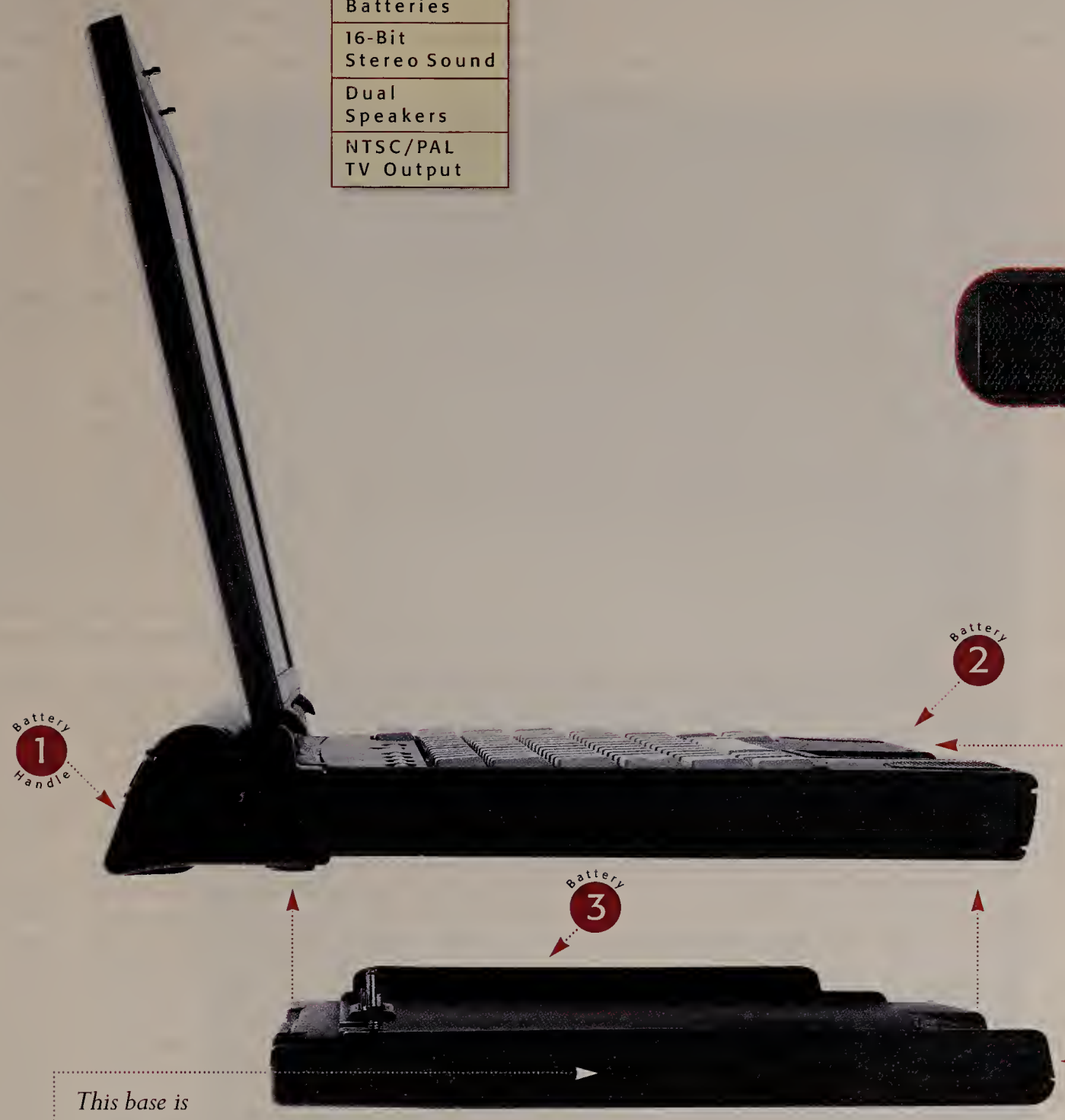

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Attachmate revs groupware package

OpenMind gains add-on Web module, improves replication and administration features.

By Barb Cole
Bellevue, Wash.

Attachmate Corp. this week will announce a new version of its groupware that extends the product's reach to the World-Wide Web and improves its replication and administration capabilities.

The OpenMind 3.0 client includes the company's Emissary Desktop Web browser, providing 'Net access to the groupware.

An OpenMind Web add-on module, due in September, will give any user with an industry-standard Web browser access to the groupware system.

"In the past, you had to have a connection to an OpenMind server [to participate in a threaded discussion,]" said David Strom, president of David Strom, Inc., a Port Washington, N.Y.-based market research and consulting firm. "Instead of setting up a remote [OpenMind] session, you can now use the Web browser," he said.

Company:	Attachmate
Based:	Bellevue, Wash.
Founded:	1984
Number of employees:	2,000
Financials:	Privately held
Primary products:	OpenMind line of groupware; Extra software for accessing host data from PCs; Remote LAN remote access software.
Main groupware competitor:	Lotus

The new version may also be used to embed links to Web sites within OpenMind discussions, said Vicki Miller, director of information systems and services at AT&T Wireless Services, Inc. in Kirkland, Wash., which runs the groupware over a wireless net.

OpenMind overlaps the discussion database and document management features of Lotus Development Corp.'s Notes, but lacks Notes' rich application development capabilities. Despite its limitations, OpenMind is well regarded by analysts and users because it lets companies build basic collaborative applications without pledging significant IT resources.

In addition to adding Web hooks, Attachmate plans to slash the price of OpenMind.

The Windows NT-based server software, which previously sold for $995, will cost about $75, and the client price will drop from $195 to about $50 per user.

✆Attachmate: (206) 644-4010.

Sniffer

Continued from page 6

analyzer. These features include "expert support" for FDDI, Fast Ethernet and ISDN Primary Rate Interface and Basic Rate Interface protocols. Expert support means raw data is translated into English text as well as tables automatically.

DSS previously supported FDDI without expert capability as well as 10M bit/sec Ethernet.

Enhancements also include database query analysis for Oracle Corp. and Sybase, Inc. databases, and real-time analysis of those queries as they occur. In addition, DSS 4.0 now works with Cabletron Systems, Inc.'s Spectrum management platform.

The one new product in the suite is a Unix-based tool that will deposit data collected from the Sniffer or a Remote Monitoring (RMON) probe into a centralized SQL database that can then be used to generate reports.

Other components of the suite include:

■ SharpShooter 3.0, a new version of the company's server management tool that now includes support for Web servers.

■ A third-party product called Netsys Enterprise/Solver for managing Cisco Systems, Inc. routers.

■ The Foundation Manager RMON probe, which now supports the RMON2 standard.

Data from SharpShooter 3.0 and the Netsys product are not currently routed to the Reporter for Unix product, which feeds data to network management platforms. Tighter integration is coming, according to Network General officials.

Network analyzers have previously been an afterthought for many, but that may now change, noted Kim Lorencic, senior analyst at the Boston, Mass.-based Yankee Group consultancy.

The Network Visibility Solution set is available now except for DSS 4.0, which ships at the end of the month. The cost is $2,000 per segment for up to 16 network segments.

✆Network General: (800) 764-3337.

Internet

Continued from page 1

tent and even criminalizing some forms of communication.

And while much of the Internet Society's sixth annual conference focused on more familiar fare, such as technical issues and business applications, a number of sessions addressed the larger social and political implications of a world linked via cyberspace.

At the Internet and Civil Liberties forum, Karen Sorensen, online researcher for the organization Human Rights Watch (HRW), said, "The battle to protect freedom of speech on the Internet is only beginning."

Sorensen is author of "Silencing the Net," a report published by HRW that chronicles efforts by governments around the world to control cyberspace.

In the report, she writes that "even at this relatively early stage of the Internet's development, a wide range of restrictions on online communication have been put in place in at least 20 countries" (see graphic, page 1).

These efforts range from China's hardline strategy — users and Internet Service Providers (ISP) must register with the police — to the U.K.'s policy, which so far relies on existing obscenity laws to curb pornography on the 'Net.

Other countries have tried to impose restrictions, with less success. The Communications Decency Act signed by President Clinton in February was overturned last month by a federal court in Philadelphia (see News briefs, page 6). And a proposed New Zealand law that would have cut off all users from any site that transmitted even one piece of objectionable material to any user may be mired permanently in political limbo, according to the HRW report.

The obvious power of the Internet — which a federal judge in the Philadelphia case called "the most participatory form of mass speech ever developed" — has not been lost on governments inclined to control information and act as moral policemen.

"You can see, in some of the developing nations, the governments have caught on" to the Internet's potential, said Barry Steinhardt, associate director of the American Civil Liberties Union and co-organizer of an international effort to protect free speech in cyberspace (see related story).

These governments have figured out that "it's impossible to control content without also controlling access," he said. The best way governments can control access, he said, "is by becoming themselves the only access provider." Vietnam and Saudi Arabia are two such countries where governments act as sole access providers to their populations.

"The actions taken by even the most obscure politician in the smallest nation can affect the entire 'Net," Steinhardt said.

Such a strategy can work early in the game. Not so in the U.S., where cyberspace has been well traveled for several years, Steinhardt said. "In this country, the genie is already out of the bottle," he said. "There are too many ways to gain access to the Internet."

One nation in which the Internet has grown rapidly in the past year is the Philippines. According to Ricardo Gonzales, vice president of product and development for Hypertech Corp., a Philippine computer distributor, there are now 40 ISPs in the Philippines, compared to only three in 1995.

Gonzales said currently there are no restrictions on Internet access in his country. But proposals have been made, and that worries him both in terms of civil liberties and "the bottom line."

"Our business will not prosper without the prospering of the Internet," Gonzales said. "We need to have a long-term commitment to the growth of the Internet."

The ability of corporations to do business through the Internet multinationally may very well be hampered by governmental restrictions anywhere.

"The actions taken by even the most obscure politician in the smallest nation can affect the entire 'Net," Steinhardt said.

Sorensen predicts that "the next really hot battleground will be the European Union." France, in particular, Sorensen said, "is pushing hard for content control."

Such efforts by his government "deeply concern" Stephane Bortzmeyer, a member of the French Society of Internet Users.

In May, Bortzmeyer said, two access providers were raided by law enforcement because child pornography allegedly was distributed through their service. The providers spent the night in jail, and, though formal charges were not filed, the episode sent a chilling message, he said.

"No one wants to be on television with the words 'child pornographer' under their picture," Bortzmeyer said. ■

Free speech proponents unite

It was a modest group that gathered last Wednesday in the midst of the organized chaos at INET '96. The attendees included teachers, journalists, civil rights lawyers, cyber-activists, and even a guy from IBM.

The goal of the 20 or so people who assembled in a cavernous room at the Montreal Convention Center, however, is anything but modest: to establish an international alliance to protect free speech and privacy rights on the Internet.

Organized by the Electronic Privacy Information Center (EPIC), the American Civil Liberties Union, Human Rights Watch and Privacy International, the meeting drew citizens of the U.S., Canada, France, Argentina and the Philippines.

All agreed that efforts by governments to restrict Internet access and content threatened global computer networking. But that was the easy part.

The group then went on to grapple with logistical questions such as how to disseminate information (electronic mail and an online information archive); what language to use (English); and whether future meetings in person were practical (maybe).

"We've got to start somewhere," said David Sobel, legal counsel for EPIC.

— Chris Nerney

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Digital Subscriber Line makes a SuperComm splash

By Tim Greene
Dallas

The big guns are beginning to go public with their interest in Asymmetric Digital Subscriber Line (ADSL) and other DSL technology for broadband services over copper local loops.

At SuperComm last week, Alcatel Telecom, Cisco Systems, Inc., General DataComm, Inc. (GDC) and NEC Corp. demonstrated products with DSL technology from other vendors or announced DSL products of their own.

SUPERCOMM '96

"ADSL replaced ATM as they acronym of the hour," said Kieran Taylor, broadband consultant with TeleChoice, Inc., a consultancy in Verona, N.J.

NEC and Alcatel plan to develop their own DSL chips. Amati Communications Corp. will provide NEC with the technology to produce Very high-speed DSL (VDSL) chips capable of transmitting up to 60M bit/sec over a single pair of copper wires at distances of as much as 6,000 feet.

Alcatel said it would make its own DSL chips and install them in a modem with an ATM interface. An Ethernet interface is scheduled for later.

GDC showed its High-speed Digital Subscriber Line (HDSL) access shelf, the UAS 7000, addressing the space problem carriers will face provisioning DSL services if they have to use modem banks. HDSL supports bidirectional 2M bit/sec links. ADSL interfaces that support 6M bit/sec downstream and 640K bit/sec upstream links are in the offing through an alliance with AT&T Paradyne.

Cisco and StrataCom, Inc. teamed with DSL vendor PairGain Technologies to demonstrate how PairGain HDSL modems connected to Cisco routers feeding StrataCom ATM switches could provision Internet and intranet services.

In addition, Bell Canada said it would lease ADSL-provisioned lines to Internet service providers (ISP) as part of a trial and as a general offering next year.

That model differs from U.S. trials. There, the ISP network picks up ADSL traffic as soon as it hits the central office. In U.S. trials, the traffic runs over the regional bell operating company network to an ISP point of presence.

Taylor said he expected RBOCs to adopt the model because it frees their networks from absorbing the high-bandwidth traffic. ■

Network operating systems

IBM adds global directory to OS/2

By Christine Burns
Austin, Texas

IBM this week will add a global directory service to OS/2 Warp Server that should make it easier for administrators to manage distributed networks and end users to access resources on them.

IBM's Directory and Security Server (DSS) for OS/2 is an implementation of the Open Software Foundation's Distributed Computing Environment, which is a set of directory and security services that masks differences between multivendor products and DCE-enabled applications.

DSS for OS/2 runs atop OS/2 Warp Server and replaces its limited domain structure.

DSS supports third-party authentication, which means an administrator can establish one server on the network to be the security server. When a user logs on to this server, also referred to as a domain controller, it lets other servers on the network know that the user has been approved to access them.

DSS also includes client software that can sit on any OS/2 desktop and give an administrator control of all the DCE products running on a network. Sandy Parker, IBM's product manager for DSS, said this will lower management costs because it negates the need for a systems administrator to physically go to the individual servers to change user access rights.

IBM is counting on the proliferation of DCE to challenge Novell, Inc. and its popular Novell Directory Services.

"With NetWare, you always have to use one bridge or another to go cross-platform," said Steve Gardner, president of CyberWorks Corp., an integrator in Bedford, Texas. "But just by installing the DCE services of DSS, you give all those Warp Server clients access to the enterprise without any gateways."

Charles McKelley, a programmer with IBM's personal systems division, said DSS affords network managers an easy migration path from the domain-based OS/2 Warp Server and LAN Server 4.X naming service.

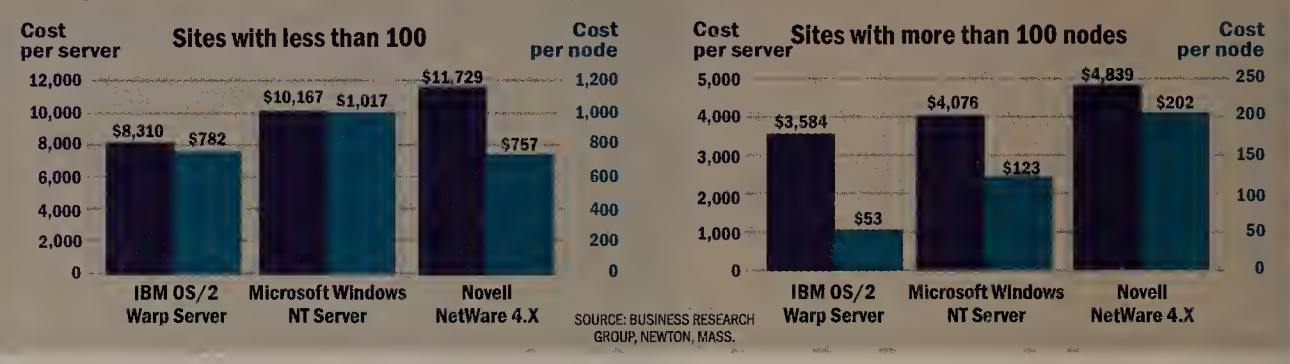
The management interface of the new directory is identical to the current one, and administrators can define user groups and access rights across the enterprise via any DCE desktop.

Administrators can deploy DSS in stages to further ease migration by only upgrading the domain controller in each workgroup without installing the client software on each desktop.

DSS for OS/2 Warp Server is priced at $3,999. ■

Cost of NOS management

IBM already has the lead in keeping NOS management costs down. The company says the addition of its Directory and Security Server will drive down the price of administering OS/2 Warp Server networks even further.



SOURCE: BUSINESS RESEARCH GROUP, NEWTON, MASS.

NAC

Continued from page 1

network resource without having to sign on to dozens of applications.

NAC — a group of 29 large organizations, including the U.S. Marines and Texaco, Inc. — will publish a white paper this month that asks network operating system (NOS) vendors and security services and application developers to open up their APIs and use security standards that work independently of an operating system's authentication process.

The problem with administering security in the enterprise currently is twofold. Users have multiple logons and as many passwords to access services around the enterprise. And network administrators spend too much time and money maintaining all of the users' access rights.

"Vendors don't understand the magnitude of this problem, and this white paper is a tool to help educate them," said James Brentano, director of Desktop and LAN Services at Pacific Bell in San Ramon, Calif.

Steve McGehee, senior security analyst with Carolina Power & Light Co. in Raleigh, N.C., said that the NAC's demands for better security services go hand-in-hand with the organization's past directory mandates.

"If you have a common directory, there is only one place to manage users and only one place to go to get the users credentials for the authentication process. It makes sense to have the services integrated and using the same API sets," McGehee said.

The paper says that while there is no security infrastucture that already has what it is looking for, it does point to the Open Software Foundation's Distributed Computing Environment (DCE) as a move in the right direction. The DCE uses an authentication brokering mechanism called Kerberos, where a user logs on to a server once and then that server authenticates the user to other servers.

"This brokering approach is the elegant solution we ultimately want," McGehee said. "But we want it easier and cheaper."

One requirement outlined in the NAC document is for NOS vendors to support and application developers to write to the Generic Security Service (GSS) API. The NOS vendors would support GSS by providing libraries that map calls from the applications to their authentication mechanism.

Other demands outlined in the paper are that operating systems vendors publish all security, directory and messaging APIs; application vendors not use proprietary security protocols; and network administrators track the amount of money they spend on managing their network security services.

Brentano said he does not expect the security services market to mature to this point for at least five years unless some of the major players in the field form strategic alliances or something develops in the Internet security arena that can then be applied to companies' internal networks.

"There is a lot of interest in using credit cards for electronic commerce over the Internet. If we start having millions of people using the same authentication method for electronic commerce, you have got to start thinking that if it's good enough to let me buy stuff over the Internet, then we could probably use the same mechanism to let employees access our own databases," Brentano said.

✆ NAC: (415) 282-8670.

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COMPAQ

General Magic seeks Web salvation

By Joanie Wexler
San Francisco

General Magic, Inc. last week announced that it has undergone a complete Web makeover.

The company will decouple its Telescript intelligent agent programming language from its Magic Cap operating system for handheld computers, and aim it at the World-Wide Web.

Anchoring the move are the new Telescript-based Tabriz AgentWare for Unix-based Web servers and Tabriz Agent Tools for developing client applications for any browser. The products will ship July 15.

Telescript has intelligent agents that hang out on network servers and grab data based on a user's interests. Agents can be particularly useful in navigating large networks, such as the Internet, which host mountains of unstructured information, said Bob Kelsch, president of General Magic.

General Magic's *Kelsch*

But General Magic has had a tough time. The company's original strategy targeted handheld communicators running Magic Cap and Telescript, and those devices have not been hot sellers.

A few ways to use Tabriz software

- **Intranet.** A corporate network manager installs Tabriz AgentWare on a Unix-based Web server and a third-party or homegrown Tabriz-based application on user PCs. Tabriz electronic agents search and filter data on the corporate network and deliver information proactively to users.
- **Web-based service.** A service provider installs Tabriz AgentWare on a Unix-based Web server. Competing merchants in a common industry, such as real estate, also install AgentWare on their servers. House hunters subscribe to the service, and their electronic agents continually search the real estate firms' Web sites for information based on the predefined parameters.
- **Web site honing.** A Webmaster installs Tabriz AgentWare on the company's site to help visitors navigate the home page. The agent can notify regular visitors when something of interest has been added to the home page.

Now the company is banking on the Web. "Our original idea was to add value to distributed networks, and now we're doing that for the biggest distributed network there is — the Internet," Kelsch said.

Object-oriented Tabriz AgentWare and Tabriz Agent Tools together aim to build an environment for creating agent-based Internet services.

AgentWare runs on Hewlett-Packard Co., Sun Microsystems, Inc. and Silicon Graphics, Inc. server operating systems and includes HTTP server support, tools for user registration management and subscriber activity tracking, Web Class Libraries and graphical development tools.

AgentWare has a suggested retail price of $4,995 per server, but will be free for the first 90 days after its ship date.

Agent Tools provides developers with components for creating agent-based Internet client applications that interact with Tabriz AgentWare servers. Agent Tools is free.

Still, some observers say the company should bite the bullet and cede to other technologies that have slid in ahead of Telescript to become de facto standards — specifically, Sun Microsystems, Inc.'s Java.

"General Magic needs to abandon Telescript, go whole hog with Java" and build client applications using their substantial agent expertise, according to John Robb, Internet analyst at Forrester Research, Inc., a consulting firm in Cambridge, Mass. "If they don't, they're goners."

General Magic said Tabriz and Java are interoperable, with Java handling the client application side and Tabriz managing the interaction of transactions, instructions and other processes on the server. ■

OpenView

Continued from page 1

soles with homegrown, Web-based management stations. TBS began rolling out its TurnerView system two years ago when HP had not yet recognized the potential or popularity of Web-based management, said Charles Hebert, senior manager of software services support for the communications company.

TBS could not wait for HP because at $50,000 per seat, OpenView was too expensive to deploy just for viewing management data, he said.

Duke Power Co. is also sizing up the benefits of Web-based management. "I see a lot of potential for distributing information internally cheaply," said Paul Edmunds, senior network analyst at Duke Power in Charlotte, N.C.

SPINNING THE OPENVIEW WEB

The Web will play a key role in the future of HP OpenView. Here is what HP has in store:

- Proposal to IETF for tunneling SNMP within HTTP
- Prototypes of OpenView applications with Web interfaces
- Plans to offer Netscape server management software later this year

A decent proposal

Should Duke Power use the Web for management, HP's IETF proposal may help the company deploy it.

The proposal suggests defining a specific device port for sending and receiving management data via HTTP, an HTTP Management Information Base, and a way to tunnel Simple Network Management Protocol data within HTTP.

"SNMP already does what you want," said John McConnell, president of McConnell Consulting, Inc. in Boulder, Colo. "Why not leverage HTTP as the pipe between the browser and the Web server? It's just a judicious way of blending capabilities."

Product bound?

These techniques could apply to the prototype Web-based management interfaces HP was showing last week.

The prototypes included restoral of a deleted file using HP's OmniBack II application; software installation using HP's Software Distributor application; and SNMP device pinging through hotlinked IP addresses. HP is also making a Netscape interface to OpenView freely available on the Web.

In addition, HP showed how Java applets can collect and display OpenView topology information on a Netscape browser, much like the mapping capability of an OpenView graphical user interface.

HP later this year will unveil IT/Operations and MeasureWare agents for monitoring 'Net server health and performance, respectively. Further out, the company will roll out IT/Administration software to change the configuration of Netscape servers, said Andy Vanagunas, HP OpenView program manager. ■

OpenView enhancements on tap

Hewlett-Packard Co. isn't blinded by the Web — the company is also busy with key OpenView enhancements in other areas.

HP last week confirmed that it will add its recently announced Event Correlation Services (ECS) software to its OpenView Network Node Manager (NNM) and IT/Operations (IT/O) management programs. ECS, originally developed for the telecommunications carrier-oriented OpenView Distributed Manager platform, is designed to alleviate event storms by correlating hundreds of events per second.

OpenView enhancements on tap

- Event Correlation Services on Network Node Manager
- Discovery and mapping of IPX nodes and devices by MAC address (for switched nets)
- SNMPv2* support through arrangement with SNMP Research

HP did not specify when ECS will be added to NNM and IT/O, but observers expect it to appear on the popular management platforms next year. Also in the pipeline are discovery and mapping of Novell, Inc. NetWare IPX nodes, and devices based on media access control addresses, said Bob Hills, HP OpenView business team manager.

For those looking to run OpenView on a Windows NT server, sources said HP will price its upcoming NNM on NT between $5,000 and $9,000. Vanagunas would not comment on pricing for NNM on NT, which is due by year-end.

Lastly, HP is going to reference sell SNMP Research, Inc.'s Two-Star Security software suite, which was jointly developed by the two companies. Two-Star Security brings SNMPv2*-based security and remote configuration capabilities to NNM 4.1, the Tornado release of OpenView that started shipping in April.

Two-Star Security costs $2,995 and will be available later this month.

—Jim Duffy

A Tornado twist for third-party apps

Users looking to upgrade to the Tornado release of Hewlett-Packard Co.'s OpenView management system may be in for an ugly surprise.

Some third-party applications do not work with a key feature of OpenView Network Node Manager (NNM) 4.1, forcing customers to use up more memory on their management consoles than they should.

The On-demand Submaps feature is designed to give operators faster access to network submaps — maps that zoom in on specific parts of a network — while reducing the amount of main memory required on the management console by 90%. The feature is supposed to load only those submaps into main memory to which an operator needs periodic access.

Previously, OpenView required operators to load all submaps for the entire enterprise network into main, or persistent, memory. The problem with NNM 4.1 is that this still seems to be the case when using some third-party applications, said Chris Amley, lead network management analyst at 3M Corp. in St. Paul, Minn.

"Third-party applications which access the OpenView database directly can't find the information they need from transient submaps," Amley said.

Seagate Enterprise Management Software, Inc.'s NerveCenter event correlator is one application that has trouble. But Seagate will remedy this with Release 2.6, due later this month, said Roselie Buonauro, the company's vice president of marketing.

HP is aware of the NNM 4.1 problem and began shipping a fix in April, said Gordon MacKinney, HP OpenView program manager.

—Jim Duffy

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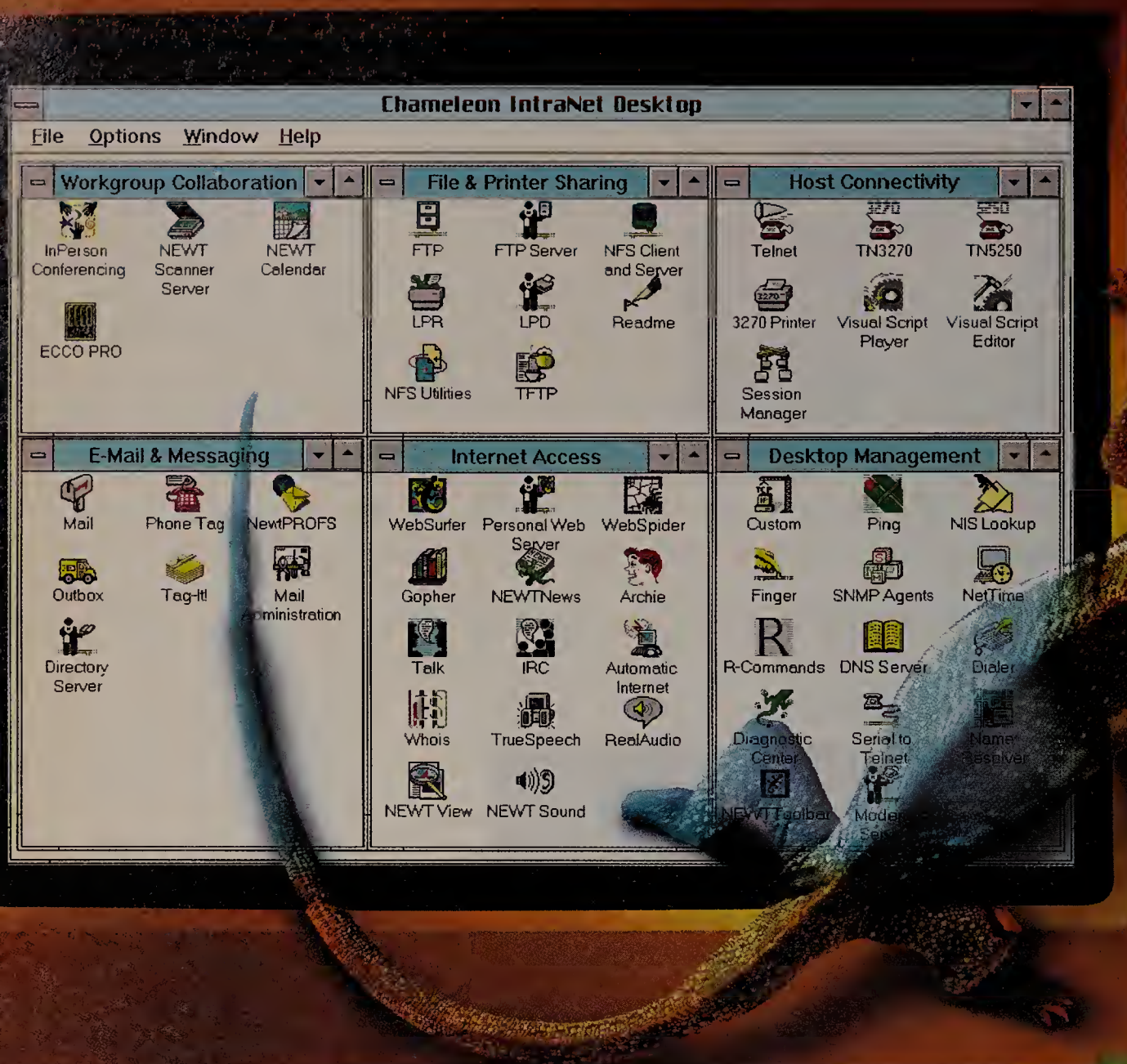

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Briefs

■ *Users who want to add and drop extra 64K bit/sec channels as needed over their* **ISDN dial-up connections** *will be able to do so using* **U.S. Robotics** *gear. U.S. Robotics announced last week that it would add TurboPPP to its Courier I-Modem, an ISDN terminal adapter and analog modem for remote offices.*

■ **MCI Telecommunications Corp.** *awarded* **Candle Corp.** *a three-year multimillion dollar contract to provide enterprise management products for its network and billing applications. Candle will employ its software to manage a variety of distributed MCI mainframe and server-based operations, company executives said.*

■ **IBM** *last week said it will reenter the* **network printer market** *it abandoned five years ago with the IBM Network Printer family. IBM spun off Lexmark International, which now has about 10% of the network printer market. Hewlett-Packard Co. has more than 50% of the market.*

■ **ADTRAN, Inc.** *last week introduced* **High-speed Digital Subscriber Line (HDSL)** *extension products at the Supercomm trade show in Dallas. The Low-Voltage HDSL extends T-1 speed service over local-loop phone lines from 12,000 to 24,000 feet using low power from the central office all the way to the customer premises.*

■ **Lucent Technologies** *plans to resell ADC Kentrox's AAC-3 access concentrator, which converts and concentrates non-Asynchronous Transfer Mode traffic for transport across* **ATM backbones.** *The AAC-3 will be resold as either customer premises equipment to aggregate a variety of traffic for an ATM service, or as a platform off of which carriers can offer non-ATM services and feed the traffic to a Lucent GlobeView-2000 switched ATM backbone.*

Users fear end of line for Cisco 7000 routers

7200 and 7500 put squeeze on 3-year-old products.

By Jim Duffy
San Jose, Calif.

Cisco Systems, Inc.'s recent announcement of the 7200 series of routers underscores what a lot of users fear may be in store for the 7000 line: retirement.

Company officials, meanwhile, said the 7000 line will be aimed at IP routing. The 7000 is not optimized for the same advanced features as the 7200.

The 7200 offers performance and port density comparable to that of the higher end 7000, but at a drastically lower price. The 7200 is intended to serve as a bridge between Cisco's mid-range 4000 series routers and the 7000 series and the top-of-the-line 7500 backbone devices (*NW*, June 3, page 1).

Download articles that explain IP routing from Network World Fusion Select News+ then WANs & Internetworking.

But because of the dual-application nature of the 7200 (it can serve as both a regional site and a backbone router), and its price and performance, some users believe the 7200 will soon bridge the 4000s only to the 7500.

"I certainly wouldn't be buying new 7000s at this point in time," said Vince Fuller, senior network architect for BBN Planet Corp. in Palo Alto, Calif.

Should Cisco pull the plug on the 7000, users would be faced with spending $10,000 to $14,000 per 7000 chassis to upgrade to 7500 processors and software, the company said. That's about 40% less than purchasing a seven-slot 7500.

Helix Health Systems, Inc. in Baltimore currently has four Cisco 7000s.

"I kind of got the feeling that the 7000 was going to be going, even when they brought out the 7500" last year, said Paul Brown, director of network operations at Helix. "Now that the 7200 is in there. . .I'm drawing that same conclusion."

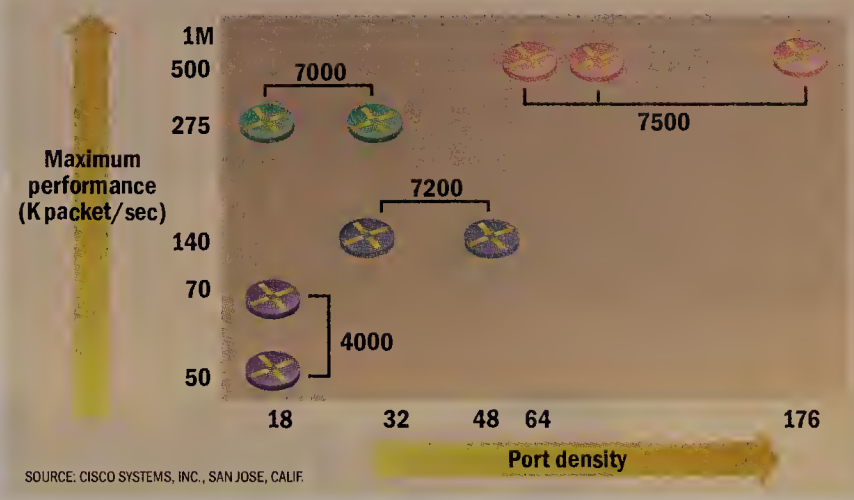
So is Indiana University in Bloomington.

"The 7000 is probably going to be discontinued before long," said Allen Robel, senior network analyst for the university's computer services department. "It's not a very cost-effective box anymore when you compare it to 7200s, 7500s."

Advanced software features such as NetFlow switching, which enhances router performance by reducing packet cache processing, appear to require an integrated route/switch processing architecture like that in the 7500 and 7200, noted Michel Lavondes, a network engineer at a large oil company in France.

Does the Cisco 7000 have a future?

Although the 7000 is a higher performance IP router than Cisco's new 7200, it is not optimized to support the same features that the 7200 and 7500 can. Users, therefore, are numbering the 7000's days.



SOURCE: CISCO SYSTEMS, INC., SAN JOSE, CALIF.

Cisco says no?

Cisco contends it is not readying the 7000 for retirement. But rather it is positioning the product as a pure vanilla IP router rather than one equipped to handle features such as NetFlow, filtering, advanced queueing and policy routing, said Susan Scheer, Cisco product marketing manager.

"There are certain cases where a customer's going to enjoy higher performance with the 7200, and certainly there's equivalent levels of density," she said.

"But customers who are opting to run IP-based networks will indeed enjoy higher performance with the 7000," Scheer said. ■

Ganymede Software tests network mettle

By Michael Cooney
Raleigh, N.C.

Anticipating problems before they occur usually requires a mind reader, but new software from Ganymede Software, Inc., will turn an ATM or wireless network administrator into just that.

The year-old company last week rolled out Version 1.1 of its Chariot network performance software that will let users simulate the traffic generated by client/ server applications over TCP/IP, ATM and wireless nets. This will help administrators determine the impact on networking gear such as routers and switches before any full-scale deployment.

Chariot has been enhanced to run on Windows 3.1 and Windows NT servers and clients, HP-UX and Solaris operating systems. The company also added support for Asynchronous Transfer Mode and wireless nets. Until now, Chariot could only run on OS/2 or Windows 95 clients and worked with SNA and TCP/IP-based nets.

"Chariot helps users determine how new applications will interact with technologies such as ATM or switching so that they can better plan and build more efficient enterprises," said Steve Joyce, Ganymede's vice president of marketing.

Chariot comprises a console application and agent software. The console application runs on Windows NT or OS/2. The agent software runs on OS/2, Windows 95, HP-UX or Solaris clients.

From the console, users can build test applications, or scripts, which are then distributed to the agents. Users have a choice of script templates or they can build their own, Joyce said.

Each agent can run the script between multiple other agents or between it and the console. After a test is done, the agent sends the results back to the console, which compiles the results and presents them on the console screen. The test measures response time and throughput between agents and the performance of net devices in between agents, Joyce explained.

Chariot 1.1 contains support for HTML so that performance results can be posted on Web pages, permitting quick access to test results from anywhere in a corporate intranet or by remote users linked to the Internet.

"We needed a tool that could accurately recreate application-level traffic and give us the ability to gauge the impact of new applications on the underlying network infrastructure," said Nancy Agosta, director of network testing at MCNC services at the North Carolina Microelectronics, Communications and Networking Center.

CHARIOT RACE

Early adopters of Chariot have included IBM and Cisco Systems, Inc. North Carolina State University and MCNC networking test labs use it to evaluate ATM implementations. The Tolly Group lab uses it to test Ethernet switches.

Chariot 1.1 will be available in August. Prices start at $9,000 for a 10-user console. Agents will cost $2,000.

✆Ganymede: (919) 558-1138.

IBM's front-end processors go multiprotocol

Big Blue enhances its FEPs by adding routing, ISDN and frame relay capabilities for mixed networks.

By Michael Cooney
Raleigh, N.C.

IBM last week continued its revamp of its venerable front-end processors by announcing new features that will help SNA users migrate to multiprotocol environments.

The company added several capabilities, including High Performance Routing (HPR), frame relay, ISDN and TCP/IP routing to the 3746 Nways Controller Models 900 and 950, finally enabling each to become key cogs in mixed SNA and non-SNA enterprises.

The 3746 Model 900 is an adjunct to the 3745 FEP, providing it with additional frame relay ports, for example. The Model 950 is a stand-alone, next-generation FEP, but it does not run the 3745's Network Control Program, thus saving users thousands of dollars in recurring monthly software costs. The 950 acts more like a switch than a traditional FEP.

Both boxes are strategically important to IBM as it tries to provide its SNA users with a smooth migration path to multiprotocol nets. The Model 950 is also significant because it is often the target of Cisco Systems, Inc. and its channel-attached router.

Analysts said the enhancements were key for IBM, which is trying to keep its SNA user base happy. These same analysts added that the company has taken too long to get some of the support, particularly TCP/IP routing, out of the lab and into the real world. The TCP/IP routing support in the 950, for example, will not be available until December.

"The fact that SNA users are going to be able to get HPR support from IBM's competitors before IBM gets it into the Model 950 is a big mistake for IBM."

Anura Gurugé

"It's really too little too late for many users who are already looking elsewhere for multiprotocol support," said Anura Gurugé, an independent analyst based in New Ipswich, N.H.

Nevertheless, IBM has added support for the native TCP/IP routing protocols Open Shortest Path First and Routing Information Protocol to the 3746-950. IBM said the improvements will enable the box to route TCP/IP and be a high-speed channel gateway to mainframe resources.

The product has also received HPR support, which IBM claims will enable it to switch SNA/Advanced Peer-to-Peer Networking traffic around net failures and improve APPN net performance by approximately threefold. HPR is an extension of APPN and adds a number of improvements to it, including congestion control.

Other enhancements for the 374X family include:

- NCP Version 7.5, which supports the new frame relay and HPR functions of the 3746-900.
- NCPTuneMON 2.3, a program that helps users tune mixed SNA and TP/IP nets connected to the 3746-900.
- Primary rate ISDN card for the 3746-900.

©IBM: (800) 426-3333.

COMMENTS?

See "How to reach us" on page 6.

Carrier Services

Covering: Local and Long-Distance Services • Value-Added Networks • Cable, Satellite and Wireless Networks • Regulatory Affairs • Carrier-Based Internet Services

Briefs

■ **MCI Communications Corp.** *last week announced the availability of an intercontinental extension to its* **Switched Multimegabit Data Service,** *now running between the U.S. and U.K. at speeds up to 10M bit/sec. Called SMDS International, the service will be managed off-shore by MCI partner British Telecommunications plc.*

■ **AT&T** *recently said third-party software makers are bundling its WorldNet* **dial Internet access service** *along with their products. The new products, including WorldNet dial software, are Grolier Multimedia Publishing Co.'s Multimedia Encyclopedia, IMSI EZ Language foreign language tutorials, Mindscape, Inc. game, Houghton-Mifflin Interactive Corp. educational games and Starfish Software, Inc. Internet utilities.*

■ **Frontier Corp.** *has signed a three-year agreement with* **TTI Telecommunications, Inc.** *to provide TTI with long-distance service for TTI's resale business, which focuses on* **Asian-American markets.** *Frontier will provide 1+ dialing, 800 services, prepaid calling cards and operator services. TTI already offers service in 36 states.*

■ **ED TEL Communications, Inc.,** *the telephone carrier in Edmonton, Canada, today will start a trial of AT&T Paradyne Asymmetric and Symmetric Digital Subscriber Line PC cards and modems for Internet access, remote LAN access and videoconferencing applications. DSL technology offers speeds up to 2M bit/sec over regular copper phone wires.*

■ **Omnitel,** *a wireless network operator in Italy partly owned by Bell Atlantic Corp., last week said it will provide Globalstar* **satellite-based services** *to GSM customers. GSM is the premier digital cellular technology in Europe and other non-U.S. countries.*

In-Site

ATM technology shines in White House cameo

By Joanie Wexler
Washington, D.C.

The White House recently became a temporary test lab for Asynchronous Transfer Mode networking. It all happened last month when Vice President Al Gore stepped forward to conduct a videoconference on technology issues for a group of high-level corporate managers convened at Amoco Corp.'s Chicago headquarters.


Amoco's *Beering*

The audience was the Executive Leadership Council, a group of African-American managers of which Carl Williams, Amoco's chief information officer, is a member. Since it was Williams' turn to host the meeting, he called in Amoco telecommunications staff analyst David Beering — also one of the industry's most seasoned ATM users — to set up a videoconferencing link.

Beering plugged in ATM gear amidst bomb-sniffing German shepherds and metal detectors at Washington, D.C.'s 1600 Pennsylvania Ave. He also had to provision a temporary, six-block-long Bell Atlantic Corp. T-3 link from the famous address into Sprint Corp.'s long-haul net.

At the Chicago end, the conference linked to the Ameritech Corp. T-3 ATM service, then terminated across MFS Communications Company, Inc. access lines used by Amoco. The conference used a constant bit rate (CBR) tunnel of 30M bit/sec — 27M bit/sec for video — through the interconnected nets. CBR, which behaves like a nailed-up, circuit-switched service, is used for delay-sensitive traffic such as voice and video.

Amoco is pretty familiar with the services and equipment after having had three years of experience in the ATM Research Industrial Enterprise Study, or ARIES, project. That project tests sending seismic data from the ocean floor to supercomputing centers over ATM for scientific analysis (*NW*, Jan. 17, 1994, page 1).

For ARIES, Amoco already has an eight-port Newbridge Networks, Inc. 36150 ATM switch on its premises. Outfitting the White House with a matching 36150 and the T-3 line took about six hours, Beering said, "and the network didn't burp." This is a sign that intercarrier interfaces for passing customer data between nets are working.

In fact, "I don't think Vice President Gore even knew he was using ATM," said Jim Payne, assistant vice president for Sprint's Federal Telecommunications System (FTS) 2000 program, whereby Sprint supplies the federal government with telecommunications services.

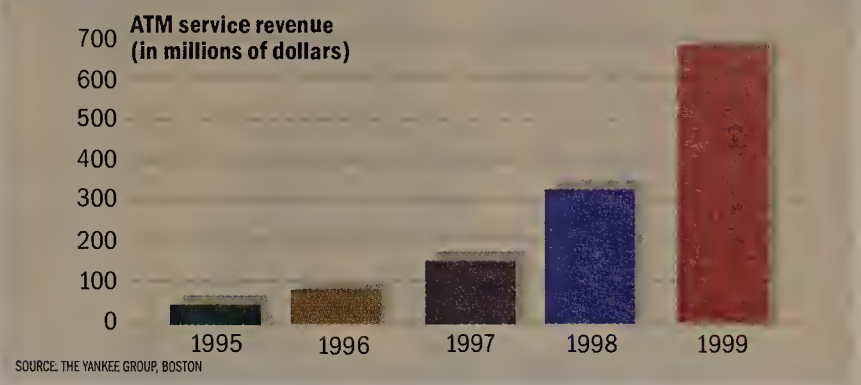
Since Bell Atlantic has only just announced ATM service, the Bell company's access into the Sprint network was a dedicated line, not switched ATM. This would have made a difference, Beering said, had there been multiple sites participating.

For multipoint networking, an advantage of locally switched ATM services hooking to long-distance ATM nets is that traffic does not go into the long-haul network and back out.

On the other hand, in this point-to-point setup, "several milliseconds of delay would actually have been introduced" had traffic traversed a couple of Bell Atlantic ATM switches, he said. ■

Slow but steady

The so-far sluggish ATM services mart is expected to more than double each year for the next few years.



SOURCE: THE YANKEE GROUP, BOSTON

Telephony apps for the 'Net

ISP takes fax hosting plunge

By Joanie Wexler
Cambridge, Mass.

Telephony applications for the Internet are slowly finding their way onto Internet service provider (ISP) hosts, where they must ultimately reside to fatten up user pocketbooks.

Last week, NetCentric Corp., based here, claimed it is the first 'Net telephony software maker to score with an ISP. It said it has signed up Concentric Network Corp., an ISP headquartered in Cupertino, Calif., to host new NetCentric faxing software called POPware in its 200 North American points of presence come August.

POPware accepts compressed and encrypted faxes from 'Net-connected users running NetCentric's FaxStorm Desktop client software, which was also announced last week. POPware then figures out which POPware host is closest to the fax's intended destination, routes it there and passes it off to the local telephone network for delivery. The long-distance portion of the trip is virtually free.

Internet connectivity is quickly becoming a commodity item, so ISPs are seeking ways to differentiate themselves. "Faxing is a way to add value for customers to be online," said Concentric spokeswoman Kristine Loosley.

Relationships with infrastructure providers are key to telephony-oriented 'Net applications, whose usefulness hinges on very broad connectivity. Until more ISP hosts support its software, NetCentric is offering 'Net fax services itself by hosting its own POPware servers.

"They're in a chicken-and-egg situation to achieve critical mass," said Maury Kauffman, managing partner of The Kauffman Group, a consulting firm in Cherry Hill, N.J. "NetCentric can't close ISP deals without putting the system in place to prove that it works," he noted. But the firm needs the ISP support to expand the connectivity.

NetCentric users can send point-to-point and broadcast faxes. Introductory prices are $9.95, $19.95 or $59.95 per month (for volumes that translate into 2 to 8 cents per minute) with a free 10 minutes of faxing for the first 50,000 people who download the free client software from the Internet (http://www.netcentric.com). Loosley said Concentric would adopt NetCentric's pricing.

FaxStorm Desktop features a real-time status manager that confirms delivery and resends if necessary. That feature appeals to beta customer Megan Davis, administrative assistant at Off Wall Street Consulting based here. Davis said she "likes to be in control" of her broadcast faxes, rather than trusting delivery to an outside service bureau.

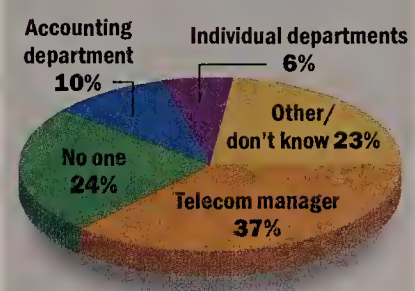
In addition, users of traditional fax software, such as Delrina Corp.'s WinFax and Microsoft Corp.'s Exchange, can Internet-enable those applications with another NetCentric product, FaxStorm SoftModem.

✆NetCentric: (617) 868-8600.

THE BUCK STOPS...WHERE?

Though a whopping **41%** of the average **$37 million** annual Fortune 500 telephone bill ($15 million) goes to fax, nearly **a quarter** of companies don't even bother to track fax costs or try to reduce them.

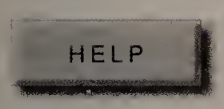
Who tracks fax costs



SOURCE: PITNEY BOWES/GALLUP POLL, APRIL 1996
SURVEY BASE: 312 FORTUNE 500 TELECOMMUNICATIONS MANAGERS

"Funny,
I thought my
job description
said
MIS manager
not

test pilot."



Uh-oh. It's time to start designing a client/server network. All in the line of duty, of course. The trick is to do it somehow without risking your life.

The problem can be summed up in a few words. Words like "danger." And "why me?"

Wouldn't it be nice if you could see exactly how things were going to work before rocketing headlong into a sky full of question marks?

That's what we thought.

At IBM, we've spent years helping a wide variety of companies find an even wider variety of client/server solutions. Recently, we took what we've learned over those years, the accumulated wealth of knowledge, solutions, ideas, inspirations and innovations, and published them on a Lotus Notes® database.

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WAN MONITOR

Identity stealing in the Internet age

You know the saying, "On the Internet, no one knows you're a dog."? It's rather convenient if you happen to be a dog, but it poses a rather alarming risk, as well. You can say you are anyone, and no one may stop to question otherwise.

I (Heckart) recently became unwittingly involved in a rather bizarre event that made me consider the disadvantages of the open and unfettered Internet environment.

In my case, someone posted a terrible comment on the Republican National Committee's guestbook under my name. Pre-Internet, a hate letter to a specific individual or organization using my name would be easy to disprove. But the electronic world makes it very hard to pull off because there's no human intervention to decide whether what's being published makes sense or should be edited.

I turned to an Internet expert, Russ McGuire at WilTel Internet Services, for more information. As he points out, what happened to me is roughly analogous to someone writing "For a good time, call. . ." on the bathroom wall.

"Why don't Web sites just verify addresses automatically instead of relying on people to type in their name and E-mail address?" I asked. In demonstrating how difficult this is to protect against, Russ made his E-mail back to me look like it came from my address. Touche.

Authentication technology is relatively well established, but the usage barriers (namely lack of support in all the installed and freely available E-mail clients/Web browsers in the world) keep most companies from implementing it on their servers today.

In designing the Web site for Penwell Publishing Co.'s OGJonline (www.ogjonline.com), WilTel Internet Services has put in safeguards against just this type of occurrence. To leave a message, you have to become a member.

Daniel Briere and Christine Heckart

Other examples of Internet "crimes" include someone signing you up for a mailing list on a topic in which you have no interest. This is like to someone ordering a pizza to be delivered to your house.

Or worse, someone could use your credit card and order something in your name. Fortunately, encryption is widely used to foil any attempts to grab the credit card number as it crosses the 'Net.

Maybe the worst case is when someone claims the identity of someone with authority and uses that authority in an inappropriate manner. Electronic examples would include firing someone via E-mail, using a user ID/password to gain access to a system and causing damage via that system.

At Internet World this spring, VeriSign announced a new authentication service and used Mark Andreessen of Netscape as the holder of its first digital ID. Compare this to a police badge with a badge number on it. Again, the electronic version is better than the physical world. You can immediately check that badge number against a trusted authentication service to make sure that it's legit.

I wouldn't be surprised if someone eventually brings a case to court on defamation of character over the Internet. This could set a precedent damaging the open nature of the Internet and changing the liability in this type of attack from the individual to the organizations running guest book and chat applications.

Briere is president and Heckart is director of broadband with TeleChoice, Inc., a consultancy in Verona, N.J. They can be reached at dbriere@telechoice.com and checkart@telechoice.com.

{//headline: FRAME RELAY IS NOT A RACE

{//subhead: BUT IF IT WERE, WE SEEM TO HAVE TAKEN THE LEAD

{//currentfile/Run/(Utilizing both Frame Relay and ATM technologies, mainstream companies will recoup the major investments made in existing network infrastructure.>Desh Deshpande)//sa

{//copy:>> Right now, nothing is bigger in WANs than Frame Relay. And right now, no one is bigger in WAN Frame Relay than Cascade. With more ports installed than any company in the world, Cascade has become the de facto leader.

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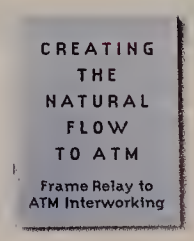

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Special Focus

TELECOM REFORM

Telecom users: Get ready for 'Let's Make a Deal'

By Tim Greene

Six months after the signing of the telecommunications reform act, users have seen little direct improvement in telecommunications service offerings and pricing.

But all that is about to change.

By year-end, with key Federal Communications Commission (FCC) rulings in place and the regional Bell operating companies hustling to assemble the credentials they need to win entry into the long-distance market, users will feel the first effects of increased competition.

They will reap the spoils of a long-distance price war and be tempted with unheard-of bundled service packages, from voice to broadband to wireless to Internet access. It will be a buyer's market for those who are well prepared, observers say. But the scene is still unfolding.

Let the buyer beware

"What we're seeing right now is a lot of talk. They haven't come to the table yet with anything," said Matthew O'Brien, president of Communications Managers Association.

And when the RBOCs finally do come up with their new offerings — long distance, for example — users will have to do their homework.

"RBOCs haven't been in long distance for a while. They're like a new carrier. How will they complete calls from New York to Los Angeles? Whose network will they use?" O'Brien said.

Even so, the chance to save will be considerable. RBOCs, seeking to capitalize on their regional brand names, will attack long-distance carriers for in-region long distance, said Brian Adamik, vice president for consumer communications for The Yankee Group in Boston. The primary weapon will be price.

The recent wholesale long-distance agreement between BellSouth Corp. and AT&T of a penny a minute and other agreements struck by other RBOCs portend very low prices for users, Adamik said.

Interexchange carrriers (IXCs) should also be able to cut similarly good wholesale deals with RBOCs to offer local service, said Ellen Clifford, a senior consultant with TeleChoice, Inc., a consultancy in Verona, N.J. And that should also mean lower consumer prices.

Adamik predicted that the RBOCs will push low-price long-distance as their major weapon until they capture 10% to 15% of the in-region market from the IXCs, then try to solidify that by bundling in other offerings.

That stage will bring into focus the ultimate goal of not only the RBOCs but of all large carriers: becoming the all-service carrier.

Right now, the carriers are just forming the alliances and developing the networks they need to offer those expanded services. "I haven't seen any of them pull their act together yet. That may take several years," said Steve Sazegari, a principal with Tele.Mac, a telecom marketing and research firm in Foster City, Calif.

Grand realignment

The headline-grabbing telecommunications changes so far have been the mergers of RBOCs, their agreements with long-distance carriers and their efforts to fulfill the 14-point FCC checklist that separates them from long-distance competition. "This is the big preamble," said Sanjay Mewada, an analyst with The Yankee Group.

The most notable changes have been two mergers: SBC Communications, Inc. with Pacific Telesis Group, and Bell Atlantic Corp. with NYNEX Corp.

While neither deal has yet been consummated, they represent the creation of mammoth entities that will likely give them the girth to survive in the new competitive marketplace. Bell Atlantic and NYNEX occupy arguably the richest telecommunications corridor in the world, while SBC and Pacific Telesis melds the considerable California and Texas markets.

The other major RBOC acquisition involves US WEST, Inc. It bought Continental Cablevision Corp., and has a concurrent partnership with Time Warner, Inc., declaring it will use cable TV networks to deliver high-bandwidth services outside its region.

The crucial point the RBOCs need to fulfill in the 14-point check list is demonstrating that local competition exists. Thus, they are energetically publicizing the interconnection agreements they are racking up to let competitors into local markets.

These include cable TV companies and traditional competitive access providers such as Teleport Communications Group (TCG) and MFS Communications Company, Inc.

In BellSouth territory, cable company Time Warner has won an interconnection agreement.

Dragging feet?

But some competitors claim the RBOCs are signing the agreements with second- and third-tier "no-name" carriers that don't really offer much in the way of competition.

AT&T has accused more than one RBOC of not offering deep enough wholesale prices for local service, and TCG says some RBOCs are slow to release telephone numbers for competitors to sell.

Read the tea leaves

The RBOCs are also starting to send up signal flares about the directions they will take when regulatory restraints are broken.

For example, Bell Atlantic introduced a local virtual private network service last month, which has a very limited appeal unless it is bundled with a long-distance VPN. But that announcement sends a message. "It says, 'We can play with the big boys,'" Clifford said.

While RBOC changes are in the air, competitors, notably the IXCs, are not sitting idly by.

They, too, are gathering steam to be all-in-one carriers, and plan to attack with low prices. For example, the offer by AT&T of 5 cents per minute to call anywhere within the Southern New England Telephone area of Connecticut and Rhode Island is a harbinger. "It's an amazing price," said The Yankee Group's Mewada.

And when the IXCs offer bundled local and long-distance service, they may have an advantage because they already have national reputations. "RBOCs have years to go before they create that single image," said Tele.Mac's Sazegari.

During the next three years, the RBOCs' major asset — revenue from local access lines — will be challenged by cable networks and wireless access, Sazegari said.

When that happens, users will have to define the strategies they will embrace in the new environment where they will be able to buy local service from more than one local carrier. And more choices means more clout, Mewada said.

He advised that users might want to take a risk and push now for super long-term deals with their current long-distance carriers. IXCs might want to do that to hold users in the face of the RBOCs' potentially lower long-distance offers to come. The more conservative approach is for users to wait for the dust to settle and see what the RBOCs actually offer.

"If I'm a large business that counts on my communications to stay in business, I would be conservative. I don't want to be a guinea pig," Clifford said.

But either way, it's a great time to be a customer. "Users are in a good position to negotiate. They can play an RBOC against MCI or whatever long-distance carrier they are using," Sazegari said. ■

The RBOC metamorphosis

Here's a summary of some of the key agreements reached by regional Bell operating companies in the wake of telecommunications reform.

- **Ameritech:** Interconnection agreements with MFS regionwide; ICG and MCI Metro in Ohio; TCG and MCI Metro in Wisconsin; Brooks Fiber in Michigan; MCI Metro in Indiana. Long-distance agreement with LDDS WorldCom.
- **Bell Atlantic:** Merger with NYNEX, interconnect with Jones Communications in Virginia. Long-distance agreement with Sprint.
- **BellSouth:** Interconnection agreements with MCI, Time Warner, Intermedia, Harte Communications, Telephone Company of Central Florida, and Florida Cable TV Association. Long-distance agreement with AT&T.
- **NYNEX:** Merger with Bell Atlantic. Interconnection agreements in New York with TCG, MFS, ACC and Cablevision Lightpath; in Boston with TCG, MFS, Brooks Fiber and MCI; and in Rhode Island with Brooks Fiber. Long-distance agreement with Sprint.
- **Pacific Telesis:** Merger with SBC. Interconnection agreement with TCG, MFS, Brooks Fiber, ICG and PacWest. Long-distance agreement expected with Sprint.
- **SBC Communications:** Merger with PacTel. Interconnection agreements with Dial US in Missouri and American Telco in Texas. Long-distance agreement expected with Sprint.
- **US WEST:** Alliance with Time Warner and purchase of Colonial Cablevision. Interconnection agreements with Electric Lightwave, MCI Metro TCG and NextLink in Washington; Electric Lightwave in Oregon and Utah.

Words of advice

Hank Levine is a partner in the Washington, D.C. law firm of Levine, Blaszak, Block and Boothby, specializing in negotiating telecommunications deals for large corporations. He says to follow two main principles when dealing with phone companies over the next six months to a year:

Levine

■ Do not extend existing contracts with interexchange carriers, even if the IXC offers what sounds like a great deal. Better deals are coming from the regional Bell operating companies. "They will undercut the IXCs to win business. That is absolutely crystal clear," Levine said.

■ Do not take a package that contains things you do not want, such as Centrex or cellular, just because the package includes a good price for long distance. "You need some improvement in all aspects of your service. Make sure you really are getting a better deal as a package," Levine said. "Did you have to buy three dead cows in order to get some steak? Well, that's not such a great deal."

— Tim Greene

Local Networks

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Hubs • Switches • Adapters and other equipment

Briefs

■ **Falcon Systems, Inc.** *has released a series of enhancements to its FastfilePro line of* **Network File System** *servers. The enhanced models include a 133-MHz Pentium processor and up to four dedicated PCI RAID processors. Falcon has also come up with an accelerator to take advantage of RAID configurations. In addition, a new quota capability allows an administrator to restrict users or groups of users to a certain amount of file space. Pricing for the upgrades starts at $18,995 for a system with 32M bytes of RAM, a 1G-byte hard drive and 7G-byte tape drive, as well as Falcon's file access operating system.*

Falcon: (800) 326-1002.

■ **Compaq Computer Corp.** *announced last week that it will chair a new working group of the PCI Special Interest Group to develop a standard for* **Hot Plug PCI** *technology. The first implementation is expected next year, offering customers a standard for replacement of PCI-based I/O boards while a computer is running. Standards addressing online PCI board upgrades and online PCI expansion will follow. The work group will ensure backward compatibility between current PCI-based cards and the new standards.*

■ **SystemSoft Corp.** *of Natick, Mass., last week unveiled PC-based software that detects, diagnoses and corrects common* **PC usage problems.** *SystemWizard does this behind the scenes, cutting down the need for end users to contact the systems administrator for help. SystemSoft announced that AST Research, Inc., Digital Equipment Corp. and Wang Laboratories, Inc. have all agreed to license SystemWizard.*

SystemSoft: (508) 651-0088.

IBM, First Virtual to put video on LANs

By Jodi Cohen

IBM last week announced it will team with First Virtual Corp. to provide its customers with real-time video to the desktop over Asynchronous Transfer Mode.

Under the relationship, IBM will provide users with 25M bit/sec ATM switches to build an ATM transport to the desktop. First Virtual will supply the ATM adapters and multimedia applications that can take advantage of ATM's Quality of Service.

Using First Virtual's Multimedia Operating System (MOS) ATM middleware, which runs on the company's Multimedia Server, customers can build ATM LANs for hosting video and other multimedia applications.

Typically, customers will install a videoconferencing unit from IBM/First Virtual partner PictureTel Corp. and plug a PictureTel codec into a PC. The PC connects to the First Virtual 25M bit/sec adapter card and then links into an IBM 8285 or 8260 ATM switch. From there, customers can go across the WAN to get to another campus and then drop back off into 25M bit/sec ATM to create a videoconference link.

Previously, IBM customers had to order expensive ISDN lines for each workstation to let them dial in to a central videoconferencing system. Now customers can use First Virtual's ATM software and ATM-to-ISDN gateway to tie existing desktops with ISDN links into ATM-based videoconferences.

The deal also will allow First Virtual customers to extend ATM-based multimedia networks from the workgroup to the campus backbone and WAN. First Virtual only offers ATM workgroup switches, but IBM provides higher end switches than can be used to build larger multimedia nets.

IBM has seen increased customer demand for desktop video products that support applications such as videoconferencing and training, according to Jim Kunkel, brand manager for ATM campus products at IBM.

"Our customers have been asking for solutions that enable them to build virtual workgroups in order to reduce travel time, speed the teaming process and raise productivity," he said. "ATM is the only technology today with the isochronous capability to deliver high-quality video."

©IBM: (800) 426-3333; First Virtual: (408) 988-7070.

Cost comparison

ATM25 products carry a high price tag, which has precluded the technology from becoming a popular choice for high-speed multimedia networks.

LAN technology:	Cost per connection (NIC and hub or switch port):
Shared Ethernet	$200
Switched Ethernet	$400
Shared token-ring	$500
Switched token-ring	$800
25M bit/sec ATM	**$800**
Shared FDDI	$850

SOURCE: MONTGOMERY SECURITIES, SAN FRANCISCO

There's more info available on Network World Fusion, including:

- A copy of our ATM switch Buyer's Guide
- A look at developing applications for ATM
- An overview on the state of the desktop video market

Select News+ then Local Networks.

NetworkWorld Fusion
http://www.nwfusion.com

Novell opens NetWare to Unix...

By Christine Burns
Orem, Utah

Novell, Inc. is making good on its promise to deliver cross-platform support for its NetWare services — at least on Unix platforms, that is.

Last week the company announced the availability of its Novell Cross-Platform Services — source code that will enable OEM partners to integrate NetWare 4.1 directory, security, symmetrical multiprocessing, and file and print services into various Unix platforms.

Novell does not expect Microsoft Corp. to license the code and is working independently to port the services to Windows NT Server by year-end.

"Having NetWare services running on Unix machines is effectively giving network managers the key to the kingdom," said Jean Bozman, an analyst with International Data Corp. in Mountain View, Calif. "While Unix has its own directory service, the ability to tie NetWare servers to Unix servers is going to be essential."

Novell's first licensee of the source code was The Santa Cruz Operation, Inc., which is now shipping Novell Cross-Platform Services on SCO UnixWare 2.1.

More recently, Novell licensed the code to Hewlett-Packard Co., which will deliver NetWare 4.1. file and print services as an add-on to HP-UX in early November, according to Patricia McHugh, an HP product manager for networking software.

Novell is "talking to all other major Unix vendors," said Marc Epstein, vice president and general manager for Novell's NetWork Services Division.

©Novell: (800) 638-9273.

UNIX MARKET SCARE

NetWare services may be just what Unix needs to help fend off Windows NT. NT will outship Unix by more than 5 to 1 by 1998, according to consultancy Dataquest in San Jose, Calif.

. . . and revamps technical service

Novell, Inc. last week announced that it is revamping its service and support offerings.

The company's Novell Support Connection group, formerly the Novell Technical Services Division, will focus on providing a more personal touch to direct support. Regional technicians armed with data about customers' networks will handle support calls, replacing a system that involved a national support center that handled service problems based solely on the product in question.

"Our engineers, as well as those working with our service partners, will have hands-on knowledge of what our customers' systems look like so we will spend less time talking about network topology and more time working on the problem," said Christine Williams, director of marketing for the support division.

Effective July 1, large customers will be able to choose among three Premium Services if they want direct support from Novell engineers.

Novell has also improved its support Web site — formerly called NetWire — with better search and navigation features.

For more details, contact Novell at (800) 858-4000.

— Christine Burns

NOVELL'S PRICES FOR PREMIUM SERVICES

Service package	Authorized calls	Support incidents handled	Annual cost
Premium 100	Unlimited	Up to 20	$7,500
Premium 200- (Incident Plan)	Unlimited	Up to 75	$24,000
(Standard Plan)	Up to 4*	Unlimited	$36,000
Premium 300	Up to 8*	Unlimited	$145,000

* The number of calls allowed is low since dedicated engineers monitor the customer's network online.

WIRED WINDOWS

Notes from the NOS and OS war zones

There are times when I feel more like a shell-shocked, battle-scarred war correspondent than a geeky, nerdy computer pundit.

The two wars I am following are on the network and desktop operating system fronts. Microsoft Corp. and Novell, Inc. are fighting to win customers' NOS business, while Microsoft is busy fending off Network Computer backers such as Oracle Corp. and Netscape Communications Corp. on the desktop.

In the NOS war, both sides have recently fired shots aimed at the other's strength. Microsoft, having taken a drubbing for supposedly backing down on its plans for directory services in the Cairo release of Windows NT, has come back with a new directory services proposal. The company's Exchange Directory announced last month should be ready to implement in Windows NT 4.0 this fall.

While Microsoft claims this is a fully developed directory service, you have to wonder why the company has been so quiet about it up to now.

One of NT's strengths has been its scalability across a variety of CPUs, including those from Intel Corp., as well as PowerPC, Alpha and other processors. Novell's previous attempts to move NetWare to other platforms, such as Portable NetWare and NetWare for PowerMac, have never been well implemented.

Dave Kearns

Now Novell has launched a strategy to port NetWare services to other operating systems. The services will run on any hardware platform supporting the operating system on which the services run.

So far, UnixWare, HP-UX and Windows NT have been announced as target platforms.

The strategy appears to be one of leveraging Novell's allies' resources to create inroads into the enemy camp. Since NT already offers NetWare File and Print Services, however, it remains to be seen how successful Novell's strategy will be.

On the desktop front, Microsoft has been fighting a different war.

The company recently launched a salvo in the form of Java support for its Internet Explorer browser.

What this does is bring Intel-based Windows 95 and Windows NT machines into full compliance with the the Network Computer specification, eliminating the need to use a newfangled Network Computer.

Rival Oracle also launched its InterOffice groupware suite with a demo on a $500 intranet appliance, or Network Computer. InterOffice isn't limited to the Network Computer platform, though.

Oracle appears to have targeted Windows 95 as the main client for InterOffice. You have to wonder why Oracle would make such a big deal of the Windows 95 client if it is trying to replace Windows 95 with a new, as yet unreleased Netscape operating system for the Network Computer.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at dkearns@msn.com.

TIP OF THE WEEK

Unisoft Wares, Inc. appears to have developed a better way for forms design, processing and management on your LAN or intranet. Beta versions of the company's developer and viewer packages are available via the Web (http://www.uwi.bc.ca/).

NET RESULTS

Despite backlash, ATM is alive and well

ATM's honeymoon with the industry and press is over.

Lately, it has become fashionable to take potshots at Asynchronous Transfer Mode technology, as well as the ATM Forum. It has become popular to say that ATM is not ready for prime time, that it will involve hardware upgrades that are too costly and that it has failed to solve problems surrounding the transport of multimedia traffic.

But is conventional wisdom about ATM correct? We don't think so.

ATM may not be trendy, like gigabit Ethernet, but it is stable and available enough to be used for building a reasonably good network.

Skip MacAskill and Melinda Le Baron

ATM backbones are alive and well, and increasing in number. And if you think this is only at universities, research facilities and those accounts where budgets are no issue, you are sadly mistaken. Insurance companies, manufacturing facilities, financial institutions, hospitals and most of the vertical markets that networking vendors know and love are diving into ATM with both feet.

The single largest reason for implementing an ATM backbone is positioning for future applications. These application requirements are far more specific than the dreaded multimedia applications that loomed large over most corporate networks.

The new applications include voice requirements, collaborative computing and high-resolution graphics.

Another reason for adopting ATM is for its bandwidth management and quality of service. Unlike the gratuitous bandwidth model that suggests big bandwidth solves all problems, network managers are looking to use bandwidth in an intelligent way. They are also looking to fine-tune the network traffic through quality-of-service features.

"With ATM, local-area networks are now gaining some of the features of the wide area, where bandwidth has always been restricted, and features were added to use that bandwidth in the best way possible," said one user. "ATM allows me to build a network where I can make decisions about what is important and what goes to the back of the queue."

So how are these companies adding ATM to their nets? The most common network design includes 10M bit/sec Ethernet switched to every desktop.

These switched links are attached to an edge device that does Ethernet switching, routing and has at least one ATM downlink. The ATM downlinks then feed into a meshed backbone of ATM switches.

Dedicated switched links to the desktop make virtual LANs a bit easier to implement. Routing at the edge allows network managers to continue with their current subnet schemes without major changes to desktop protocol addressing.

Vendors that are having trouble with ATM or have an incomplete ATM solution find gigabit Ethernet a more palatable technology and have taken the position that ATM will follow FDDI as a niche technology. Don't believe it. The reality is that installations are increasing, and the number of requests for proposal on the street that include ATM is at an all-time high.

The bottom line is that ATM is alive and well. So don't let all that doom and gloom fool you.

Le Baron is a research director and MacAskill a senior research analyst in Gartner Group, Inc.'s Network Computing Infrastructure group. They can be reached at inquiry@gartner.com or (203) 316-1111.

Acquisitions paying off for LAN management rivals

McAfee and Symantec roll out new products.

By Ben Heskett
Santa Clara, Calif.

Two LAN management rivals this week will introduce products resulting from recent acquisitions.

McAfee will debut Vycor Enterprise 3.1, a client- and server-based help desk tool that now has ties to Saber LAN Workstation, McAfee's LAN management suite. McAfee purchased Vycor Corp. in March.

Separately, Symantec Corp. has added Windows NT support to Expose 3.5, a server and device management tool obtained via its acquisition of FastTrack, Inc. three months back.

The new McAfee tool results from the first phase of integration between Vycor Enterprise and Saber LAN Workstation. Vycor Enterprise 3.1 can access data gathered by the LAN management suite.

Phases 2 and 3 include implementing a common SQL database repository and creating a hybrid interface for both products, according to David Mitchell, McAfee's director of product marketing for Vycor. These phases should be complete by year-end.

McAfee also introduced Vycor Web, which involved slapping a Web interface on Vycor's DP Umbrella help desk product. The product allows an administrator or end user to access the help desk database, log requests and receive trouble-ticket updates via a Web browser.

Vycor Enterprise 3.1 is shipping at $4,500 per help desk console. Vycor Web is shipping at $25,000 per Web server.

Symantec has added 32-bit client consoles and access to server management data via the Internet to its Expose 3.5 offering.

The tool, the first new version of Expose in a year, also includes integration with the Norton Administrator Suite-Premier Edition, a LAN/WAN management suite due by September. Administrators will be able to access Expose via the LAN management suite.

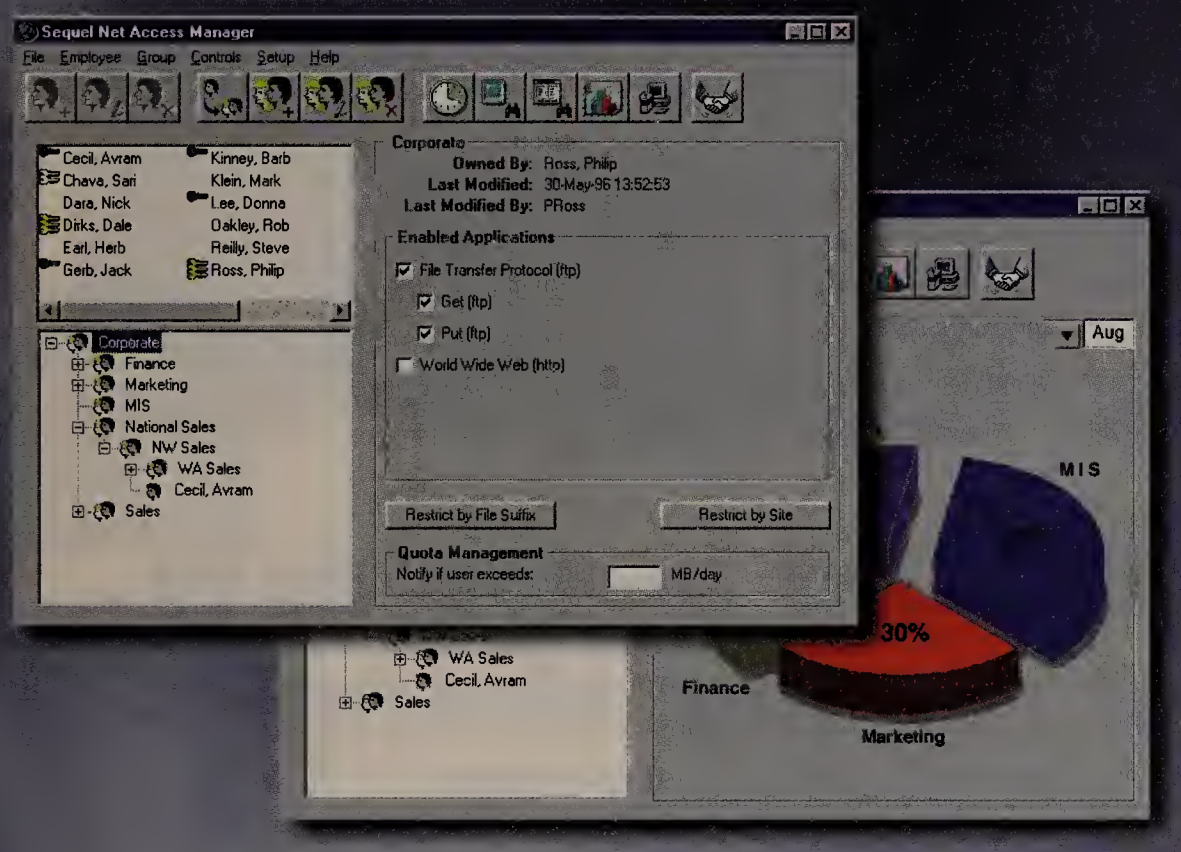
Expose 3.5 ensures that administrators can access the management data they need by copying data onto a backup server that kicks in if a primary data server fails.

The client- and server-based Expose 3.5 supports NetWare, NT Server and VINES networks. The Expose administrative console runs on Windows platforms.

Expose 3.5 is available now and is priced at $695 per server. Price breaks for 5, 10, 20, 40, 100 and 200 servers are available.

© McAfee: (408) 988-3832; Symantec: (800) 441-7234.

The Net has enormous potential to let people gather facts, share information, explore new ideas, squander resources, bloat local storage and bring your network to its knees with interminable traffic composed of who-knows-what.



Although the core of Sequel Net Access Manager is a powerful IP packet filter, the main user interface is intuitive enough for non-IS managers to establish access privileges and run reports.

Introducing Sequel Net Access Manager.

While the online revolution may well be the best thing to happen in a long time to people who use information, it could be the worst thing that ever happened to your network – if you don't know what's going on. But now there's Sequel Net Access Manager, the most effective tool for managing and reporting your company's Internet, intranet and online usage. It's easy to install, easy to use, and makes it a snap to monitor and report data traffic and service requests by user, by group or across your company. It even lets you set access and download privileges, if you choose. All without degrading performance anywhere on your system. Call **800-881-2465 ext. 4040** or visit us at **www.sequeltech.com** to learn about our free product evaluation program.

Or contact your local software reseller today.

SeQuel NET ACCESS MANAGER™

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Briefs

■ **Information Dimensions, Inc.** *in Dublin, Ohio, last week announced a rapid prototyping tool for building* **Web-based document management** *applications. The tool, dubbed Corporate Information Centre, is sold with the company's Basis Document Manager and Web-server Gateway. The product is designed to minimize the coding involved in building document applications.*

It includes templates for common Web-based document applications, such as corporate policies and research management. The software runs on Windows clients and Unix servers, and requires a Web server. Pricing starts at $25,000.

Information Dimensions: (614) 761-8083.

■ **Novasoft Systems, Inc.,** *of Burlington, Mass., is shipping a gateway for linking Lotus Development Corp.* **Notes** *software with Novasoft's NovaManage document management system. With NovaGateway, users can pull NovaManage documents into Notes. The software runs on Unix and Windows NT. Pricing is $10,000 per server and $75 per Notes client.*

Novasoft: (617) 221-0300.

■ **Platinum Technology, Inc.** *of Oakbrook Terrace, Ill., is shipping Platinum Fast Unload for Oracle, a utility that extracts information from* **Oracle Corp.** *databases up to 23 times faster than the unload utility included with the database. Database administrators may extract specific rows and columns from a database and format output so that it is compatible with several other relational databases. The software runs on Unix and costs $5,000 per server.*

Platinum: (800) 442-6861.

PeerLogic tunes its middleware for the 'Net

Version 3.7 of Pipes provides better support for applications running over low-bandwidth wide-area network connections.

By John Cox
San Francisco

PeerLogic, Inc. is slowing down its middleware...on purpose.

The company has begun shipping a version of its message-oriented middleware that is better suited than previous editions to support applications running over low-bandwidth WAN links.

By reducing the bandwidth requirements of the messaging system, PeerLogic is taking the first step toward creating a release of its Pipes Platform middleware that can run over the Internet, said Peter Tait, the company's vice president of marketing. However, the company has yet to set a release date for such a product.

Message-oriented middleware refers to tools used to simplify the building and interconnection — via asynchronous messaging — of large-scale applications across different operating systems over a network.

Download overviews of PeerLogic Pipes and message-oriented middleware from Network World Fusion. Select News+ then Client/Server Applications.

Network World Fusion
http://www.nwfusion.com

Pipes middleware includes a set of built-in application services for tasks such as ensuring messages are delivered reliably even in the face of network or system outages, as well as automatically tracking where application components are to be found on the network.

It's only natural that increasingly popular Internet and Web standards are enabling PeerLogic to extend Pipes to clients running Web browsers.

"Architecturally, our product won't change at all," Tait said. "But there are some very sophisticated algorithms that optimize Pipes' operations. We're tweaking these to reflect the reality of the Internet."

"Pipes is a fine product, but the chief complaint has been [that] it could really eat up a lot of bandwidth," said Sally Cusack, a market analyst with The Standish Group International, Inc. in Dennis, Mass. "They've addressed this in the new release — Pipes can better handle mixed speeds over the network."

Pipes Platform was originally designed with fairly high-bandwidth, reliable and secure corporate nets in mind. Release 3.7, in addition to being more efficient over low-bandwidth links typical of the 'Net, has a reworked name service that lets the software restructure itself faster when computers or networks fail.

In addition, the Pipes API has a new feature that lets developers create server-based applications that can maintain lots of connections with much less memory than was needed in the past.

Pricing starts at $250 per desktop.

✆PeerLogic: (800) 733-7601.

Applix readying Java-based client/server spreadsheet

Ellen Messmer
Westborough, Mass.

Applix, Inc. this fall plans to ship a Java-based spreadsheet that sits on a server where users with Java-enabled browsers can download the client software and use the spreadsheet remotely from wherever they are.

Called Applix Anyware, the suite of products includes the Anyware WebSheet spreadsheet and business graphics application, along with tools for providing access to real-time news sources or SQL databases.

When users with a Java browser click on an icon for the server-based spreadsheet, the Anyware client software is delivered to their desktop, said Tony Giannelli, Applix vice president of business development.

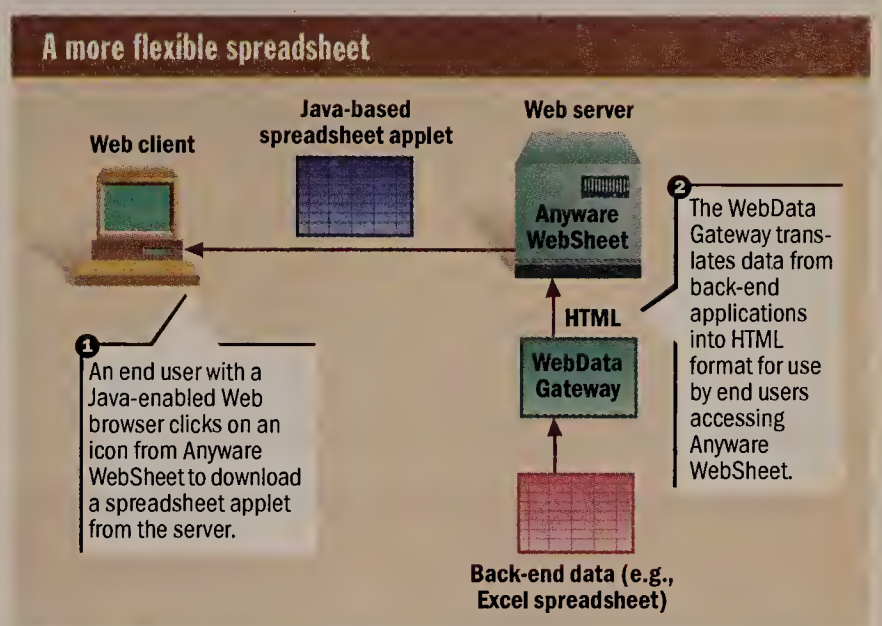
This eliminates the need to distribute client software to each desktop, and offers the possibility of making spreadsheets a part of an Internet service, as Intuit, Inc.'s Galt division plans to do as an Anyware beta tester.

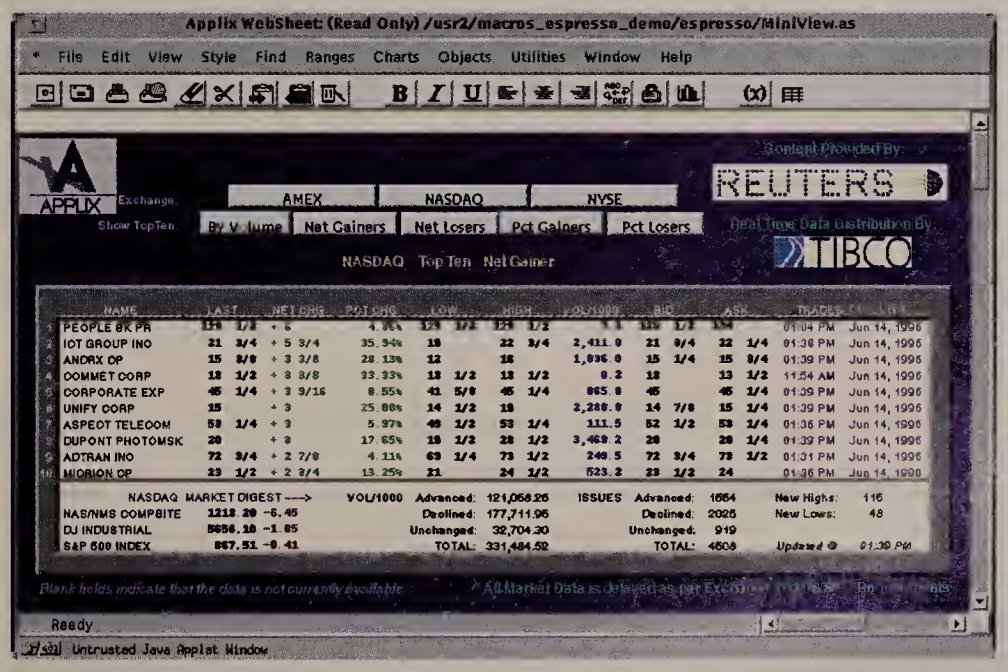
If corporations want to integrate their existing spreadsheet applications into WebSheet, the Anyware tool kit has the WebData Gateway that translates about 50 file and data formats, such as Microsoft Excel or Lotus 1-2-3 into an HTML page.

Corporations can build their own interactive applications for use on intranets or the Internet using the Anyware Innovator's Workbench.

Pricing for Applix Anyware starts at $99 per user for the Anyware client, plus $295 for the Anyware WebSheet. The RealTime Gateway, a tool for providing access to real-time news services, costs $995, and the WebData Gateway is priced at $195. The Anyware Innovator's Workbench costs $2,495.

✆Applix: (508) 870-0300.





WebSheet delivers *client software to any user with a Java-enabled Web browser.*

SHARED LOGIC

Bring on the World-Wide Web servers

The spectacular acceptance of the Web user interface has rightfully propelled vendors into a flurry of activity to beef up the technology so it can support full-fledged corporate database applications.

Is this a dream come true or what?

That depends on what the vendors produce. I expect that HTTP servers will be entirely absorbed by server operating systems: Windows NT and the various Unix derivatives. Similar to the fates of other network technologies such as File Transfer Protocol and telnet, there will be no need to purchase your basic HTTP capabilities from a vendor other than your operating system supplier.

The two required new technologies, which are already available in early releases from several vendors, are significant HTTP server extensions, such as Oracle Corp.'s WebServer, to provide access to corporate databases; and robust front-end language extensions, such as Java, to give the user interface editing and calculation power.

Extending the HTTP server is tricky. There are as many solutions as there are vendors proposing new products. So let's take a quick look at Oracle's approach because the company has already succeeded in becoming the world's leading provider of database server software and its progress relative to Web serving has been consistent and aggressive.

Oracle is pushing WebServer 2.0, and the company is already hard at work on Version 3.0, which will be released before year-end. What the company has come up with, which I find noteworthy, is a four-tier client/server architecture involving browser, HTTP, broker and executable components. Oracle calls the HTTP component a Web Listener, the bro- ker is a Web Request Broker, and the executable components the Web-Server Extensions.

Marc Myers

What is noteworthy is that Oracle has identified a fundamental architectural opportunity: Keep the HTTP server streamlined and simple so it can directly deliver HTML pages for simple requests. Then pass any additional requests to the Web Request Broker, which can direct traffic to one of the WebServer Extension modules. Oracle intelligently elected to offer the specifications for Extension modules to the public domain.

WebServer 2.0 allows you to create, for example, a PL-SQL database backup program for your customer database that can be fired off from the HTML user interface by clicking the Backup Database button.

While Oracle is not the only vendor creating database middleware for the Internet, the company is the most experienced and successful at this style of software development. The fact that it has implemented a brokered middleware solution means that multiple interdependent processes will be kicked off in very tight timeframes, an ideal scenario for a massively parallel or symmetrically parallel hardware solution. It also means that popular server extensions, such as Java, can easily be assimilated as WebServer Extensions.

While the Web is tempting to corporations frustrated by the proprietary and highly unmanageable nature of other client-side software, the moment to move to high-volume, Web-based corporate applications has not yet arrived. But with the extremely fast product cycles that we're witnessing among vendors competing for Web market share, expect to be able to make such a move in about six months.

Myers is president of Client/Server Connection, Ltd., a Cambridge, Mass., firm specializing in client/server software solutions. He can be reached at (800) 622-1108, Ext. 522, or via CompuServe at 71332,1726.

Intranets & the 'Net

Covering: Internet Technologies and Services for Collaboration and Electronic Commerce

Briefs

■ **MapInfo Corp.** *of Troy, N.Y., today will announce its Pro-Server software suite for developing* **Web-based desktop mapping** *applications that can be accessed through any Web browsers or Windows-based clients through Network OLE. MapInfo software runs on Windows 95 and Windows NT.*

Beta versions are currently available free of charge from MapInfo's Web site (http://www.mapinfo.com). Final versions are scheduled to ship in September. A typical installation that can service 200 within minutes is expected to sell for $25,000, company officials said.

MapInfo: (800) 327-8627.

■ **Quarterdeck Corp.** *last month rolled out WebAuthor 2.5, an update to its* **HTML authoring tool** *that now supports Windows 95 and Windows NT. The new version features a document preview button that lets users check their page's appearance as it is being edited. It sells for $49.95.*

Quarterdeck: (310) 309-3700.

■ **OpenConnect Systems, Inc.** *has released the beta version of OC://WebConnect Web 3270 1.2, a Java-enabled Web server that* **encrypts Java datastreams** *between a Java-enabled browser on the desktop and the OpenConnect server over intranets or the Internet. The beta version can be downloaded at http://www.oc.com.*

■ *The* **Senate Judiciary Committee** *has approved a bill sponsored by Sen. Jon Kyl (R-Ariz.) that would let courts put* **hackers convicted of unauthorized computer entry** *in jail for five years and fine them for theft of computer information. The bill is expected to be put to a full Senate vote this summer.*

VeriFone Web software handles credit card info

Wells Fargo signed up as first bank to use company's SET-based software for transmitting credit card numbers.

By Ellen Messmer
San Francisco

VeriFone, Inc. recently unveiled software that will enable merchants on the World-Wide Web to track orders and transmit credit card numbers in encrypted form directly to a bank's Web site to get customer card authorization.

VeriFone's vPOS for Web-based merchants and vGate for financial institutions together will let merchants get credit approval over the Internet instead of having to input into a point-of-sale device the card number the customer sends to the merchant's Web server with an order.

Both vPOS and vGate are partially based on the Secure Electronic Transactions (SET) industry standard proposed by MasterCard International, Inc. and Visa International, Inc. for encrypting credit card numbers and authenticating cardholder identity. Both products will ship in the third quarter.

End-to-end SET-compliant systems will not be complete until Visa and MasterCard deliver SET client software or hardware tokens with public-key certificates into the hands of cardholders. This process is taking longer than first thought, said Roger Bertman, vice president and general manager of VeriFone's Internet Commerce Division.

VeriFone is developing SET-based software for consumers called the vWallet, which will provide cardholder authentication on the Web as well as hold digital receipts that can be shared with personal finance programs.

In the interim, the merchant's software, which works with Web servers from Oracle Corp. or Netscape Communications Corp., will take a credit card number the customer encrypts with a browser using the existing Secure Sockets Layer (SSL) protocol and translate it into SET.

Wells Fargo & Co. will be the first bank using vGate. Dudley Nigg, Wells Fargo executive vice president, said this is a suitable first step until the Visa/MasterCard public-key infrastructure is established.

Tom Pouliot, MasterCard director of electronic commerce, said SET is facing delays on several counts. The card association has not definitively determined a key infrastructure or decided who would hold the route key that needs to be guarded.

He also said the standard has not been granted export clearance from the U.S. government. This is because SET software and hardware will use encryption, which is subject to strict export restrictions. "We want [SET] to be international, not just domestic," Pouliot said.

"It's all very undecided. We need a certificate authority infrastructure"

Roger Bertman, VeriFone

Atalla, the security division of Tandem Computers, Inc., is expected to soon unveil a product line to compete with VeriFone's. Atalla's offering, however, may not face the same tough government scrutiny.

Called the WebSafe Commerce Security Product, it will use key-escrow technology developed by Trusted Information Systems, Inc., which the government favors because law enforcement and any authorized party can unscramble data encrypted with it.

✆ VeriFone: (415) 591-6500.

Netcom targets business users, but suffers big outage

All of company's 400,000 customers were affected by traffic mishap on ATM backbone.

By Joanie Wexler
San Jose, Calif.

Netcom On-Line Communications Services won't let a little downtime stop it.

In fact, the company late last month officially got serious about business customers, announcing fractional T-3 and dual T-1 access services and outlining its strategy for electronic commerce and hosting.

NetCom has long offered dedicated T-1, frame relay and ISDN access, and business services already account for about 17% of its revenue, according to Ben Slick, vice president of the company's business services group. But Netcom's reputation has inexplicably been consumer-oriented, and the firm is eager to set that record straight.

So it is moving beyond access services to World-Wide Web hosting, available now, and site development and intranet services. For instance, it has partnered with iCat Corp., a maker of software that allows catalog makers to convert their paper catalogs to secure electronic versions.

400,000 go offline

But the company's intentions to serve what Slick termed "the unfortunate five million," — smaller companies that, unlike the clout-rich Fortune 500, have difficulty getting volume deals with network service providers — came in the shadow of a major network outage that affected all of NetCom's 400,000 customers.

A spokesman said network traffic not intended for the Netcom T-3 ATM backbone mistakenly found its way onto it. That wreaked havoc with Netcom routing tables, which store information about the various paths available among routers.

Netcom technicians brought the entire network down from 3:30 p.m. June 18 until about 5 a.m. the following day to rebuild the routing tables, according to the spokesman, though parts of the network were not back up until noon.

Such issues are one reason that analysts question Netcom's ability to adequately serve the business market, whose expectations of performance and net availability are high.

"Others are far ahead, and the Netcom network is not industrial-strength," said Mike Rothman, vice president of global network strategies at META Group, Inc., a consulting firm in Reston, Va. "It suffers from a reputation of poor reliability," he said.

Netcom, whose huge growth caused it to double its points of presence to 230 last fall, acknowledges that it misforecast the market — as have other 'Net backbone providers.

Netcom facts and figures

- **Target market:** Midsize and small businesses, consumers
- **No. of business customers:** 2,000
- **Revenue (1995):** $54 million; 17% from business customers
- **Access options:** Dial-up (28.8K bit/sec, ISDN) and dedicated (T-1, fractional T-1, frame relay)
- **Value-added services:** Web site development hosting; electronic cataloging; security
- **Pricing model:** Flat rate
- **Where service offered:** U.S., Canada, U.K.
- **Infrastructure platform:** 45M bit/sec ATM via Cascade switches; ISDN backup

Slick, however, noted that Netcom has added more service people and a separate network operations center to serve business customers. ■

NETWORK HELP DESK

Network World *tracks down answers to your questions. Please submit them to Chris Nerney via phone at (800) 622-1108, Ext. 451, the Internet at cnerney@nww.com or fax at (508) 820-1103.*

I'm setting up a Windows 95 Push install for my users so that when they log in to their NetWare server, they'll be able to start an installation of the operating system. I'd hoped that user interaction would not be required.

I've been able to accomplish this with one exception: I'm installing Windows 95 to a new directory, leaving the users' Windows 3.X installation intact. Win95 Setup displays a dialog that warns the users that they'll need to reinstall Windows applications if they choose to install to a new directory. The users must then select a Yes or No button.

Can I automate the response to this dialog?

Via the Internet

If you've set EXPRESS=1 and INSTALLDIR=[path to install to], there's really nothing else you can do to disable messages/dialogs, says Dave Kearns, a Windows expert and independent consultant in Austin, Texas. Some dialogs are felt to be so important that they can't be turned off, he adds.

More input

In the June 10 issue, we provided advice on how to make sure that NetWare Directory Services (NDS) traffic does not saturate WAN bandwidth. Our expert suggested placing each server in its own partition within the NDS tree and then eliminating read/write replicas of the other partitions on the local server.

Eli Weitz, a Master Certified Novell Engineer/Certified Novell Instructor, says that may not be a good idea. For fault tolerance, he explains, the system defaults create three replicas of each partition. This is something that should not be tampered with, especially in a multiserver, multisite environment, Weitz says. In fact, he adds, a read/write replica of the partition should be placed on a different server. If a server fails, this will ensure that synchronization still properly occurs.

Weitz says the issue should be addressed in terms of partition and replication planning.

The right tools make security a cinch for electronic commerce

Firewalls, encryption, electronic IDs and other technologies make transactions safe.

By Gregg Lebovitz

The widespread popularity of the Internet has made the promise of worldwide electronic commerce a reality. Companies are exploring how to provide goods and services over the Internet and extend their reach to a global marketplace that is open 24 hours a day, seven days a week.

While the Internet offers enormous opportunity, it also gives rise to significant security challenges that continue to make companies and consumers apprehensive about using the 'Net for business. Nonetheless, the Internet can be secure for electronic commerce today, provided companies establish and adhere to sound online security policies and procedures.

Most security attacks can be prevented by implementing relatively low-cost security tools. In fact, the Internet can be made safer than most commercial environments, including the public telephone network, over which consumers order millions of dollars in products and services each year.

Firewalls and encryption

Some of the most effective Internet security measures are firewalls and encryption technology, which thwart close to 80% of all security threats. Firewalls reside between the Internet and a company's internal network and combine hardware, software and network security testing tools.

Firewalls effectively shield a company's known vulnerabilities against active attacks and break-ins.

Encryption technology is highly successful in combatting most passive Internet security attacks, in which intruders eavesdrop on a network so they can intercept electronic messages and passwords to unlock a company's critical resources. Encryption technology is based on mathematical algorithms. It lets two parties exchange information confidentially by storing data electronically in encoded formats that can only be decoded by authorized users.

On its own, encryption provides baseline security. Its strength lies in serving as the basis for creating powerful components of comprehensive security solutions that can eliminate inappropriate and unlawful Internet access. In addition to enhancing online privacy, encryption is used to facilitate secure electronic commerce by establishing online identities and authentication, authorizing who has access to what information, and ensuring that information has not been compromised.

Signatures and certificates

Electronic IDs or public-key certificates take encryption and Internet security a few steps further, and are critical enabling technologies for enacting broad-based electronic commerce. Digital signatures work like drivers' licenses to provide electronic proofs of identity and privileges over the Internet. Companies such as VeriSign, Inc. and Netscape Communications Corp. issue electronic IDs and act as trusted third parties to verify the online identities of consumers and vendors, and to stand behind the veracity of digital signatures.

The use of electronic IDs is, and will continue, growing rapidly as companies establish scalable hierarchies of electronic identification and access privileges. Hierarchies of privilege will allow an electronic ID granted from one organization to be recognized by another.

Using a step-by-step approach, a company can implement a sound security strategy today to take advantage of the Internet, and over time, incorporate additional security technology as it becomes available.

Companies can start by putting their IT resources behind a proven firewall that is well managed and monitored like a home alarm system. The next step is to secure communication between Web browsers and Web servers using readily available technology, such as the Secure Sockets Layer, in conjunction with authenticating certificates issued by trusted third parties. These technologies will allow existing commerce tools, such as credit cards, to be used more securely over the Internet than they are over the telephone.

Once a company has developed a secure internal strategy, it can consider using electronic IDs and authorization hierarchies to leverage the Internet for external commerce. One such proven electronic commercial application is E-Checks.

Electronic commerce is changing the way individuals and organizations do business, and security technology is a major component for making it possible. Technology advancements such as user authentication using DNA strings or retinal scans tied to digital signatures will make fraud virtually impossible.

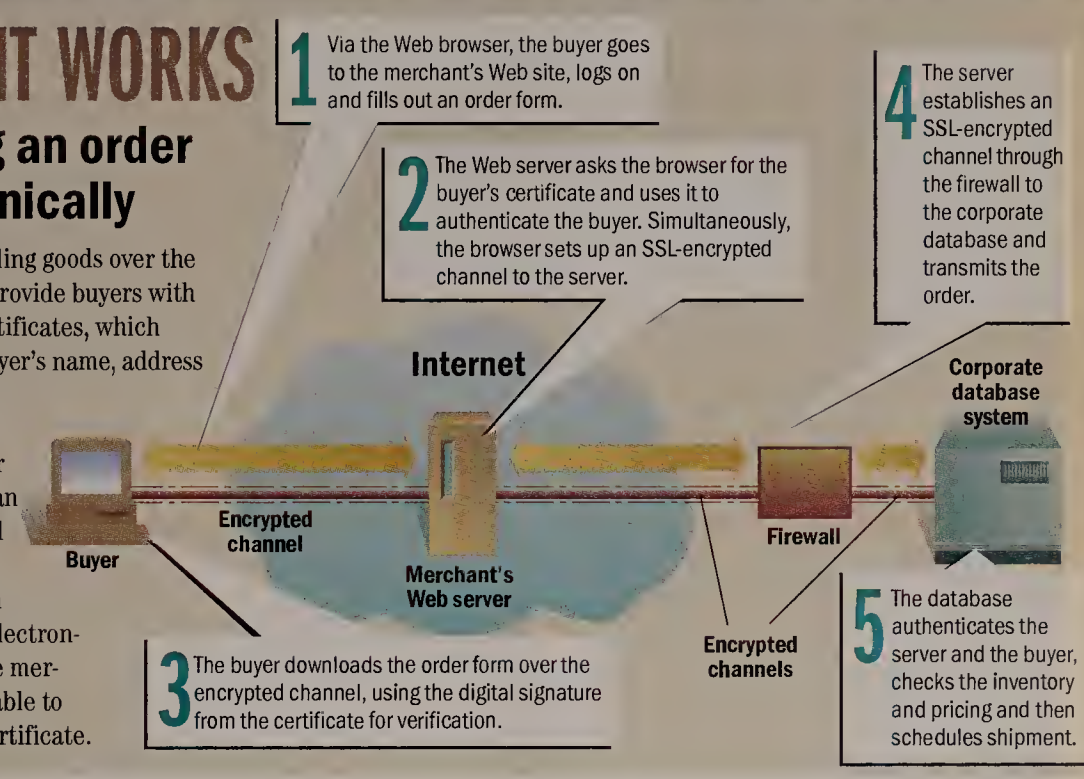
Today the Internet can be used securely and safely for electronic commerce, as long as companies implement appropriate and prudent security measures.

Lebovitz is a service line manager at BBN Planet, an Internet services company in Cambridge, Mass. He can be reached by phone at (617) 873-3137 or via the Internet at gregg@bbn.com.

HOW IT WORKS

Placing an order electronically

Merchants selling goods over the Internet can provide buyers with public-key certificates, which contain the buyer's name, address and account number. After installing their certificate on an SSL-configured Web browser, the buyers can place orders electronically. Only the merchant will be able to decrypt the certificate.



Need information?

Let *Network World* provide a quick primer on an important or emerging technology. If you have an idea for Technology Update, contact Beth Schultz by phone at (312) 283-0213 or via the Internet at bschultz@nww.com.

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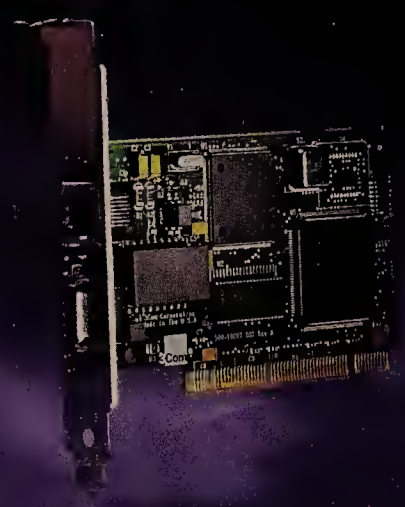
3Com's PCI Token Ring is fast, reliable, and highly Flashy, it ain't.



WORKGROUP SOLUTIONS REMOTE ACCESS SOLUTIONS STACKABLE SO

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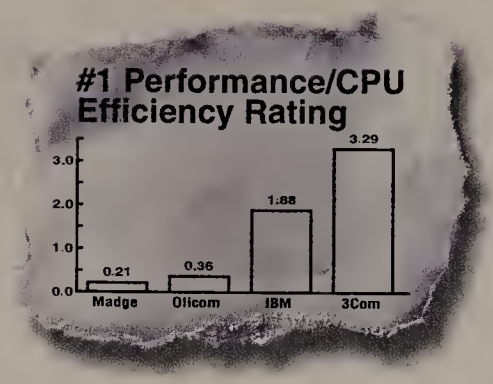
adapter acclaimed.



You might say that making bells and whistles isn't our thing. On the other hand, building fast and efficient products is. And that's what people have been saying about our Token Ring network interface cards.

They've said that our PCI Token Ring NIC has low CPU utilization, high throughput speed and that it optimizes performance in multi-tasking environments like Windows® 95 and Windows NT™. So, where's the proof? Well, in a 1996 LANQuest Labs™ study, our new TokenLink® Velocity™ PCI adapter got the best performance/efficiency rating of any PCI NIC tested. And who can argue with that?

So, come to 3Com® for your Token Ring adapters. Not only are we networking leaders, we're also committed to giving Token Ring customers innovative products to keep up with the demands of their network. Both our PCI NICs and our 100% IBM® compatible 16/4 ISA NICs come with a lifetime warranty and are available for you to evaluate today with a special introductory offer. Just don't expect it to come with a special 12-piece knife set. For more information, call **1-800-NET-3Com, Option 4.**

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EDITORIAL INSIGHTS

Intranet madness

"This week's news is brought to you by *Network World,* official enterprise network newsweekly of the 1996 Summer Olympics."

Don't laugh. It could happen. As NBC — "Must See" — TV counts us down to the Atlanta games, we're bombarded by Olympics-heavy marketing campaigns. Companies selling everything from candy bars to cameras, from cars to carbonated, caramel-colored sugar water have shelled out big bucks to put those five interlocking rings on their ads and proudly inform us at every opportunity that they are the official something-or-other of the Olympic Games.

It would be completely ludicrous were it not that the money is going to a worthy cause. What does it mean, say, to be the official rental car of the Summer Games?

It's only natural, though. Marketers crave the latest craze, they need to be associated with *the* next hot thing. Case in point: intranets.

Every type of IT vendor — from network equipment companies, to carriers, to software suppliers and network management vendors — has latched onto the intranet with a death grip. Cabletron wants to be your intranet company, as does Microsoft, Novell, MCI, Attachmate — you name 'em. Every other announcement and ad is intranet-focused.

That's not all bad, particularly for a company like mine whose bread and butter is advertising. The reality is that IT companies that provide everything from the network infrastructure to applications play a legitimate part in helping you build your intranets.

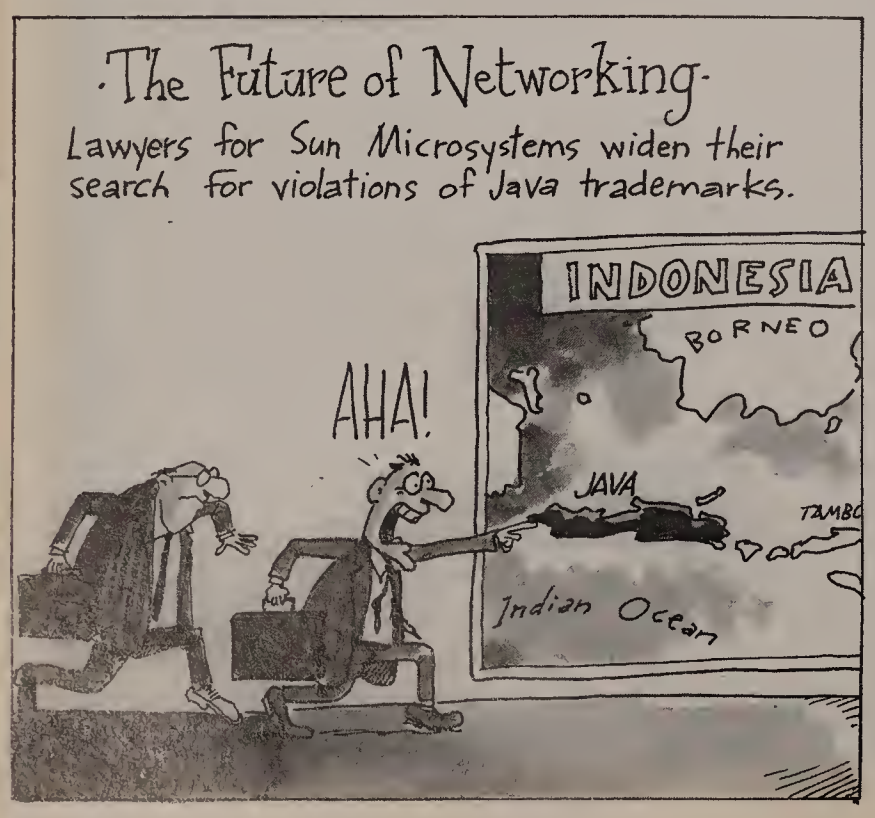
But — and here's the frustrating part — it isn't enough just to slap the word intranet on the ads, or coin a catchy intranet tagline. Vendors have to provide real products and features that help you build intranets; they must have a clear understanding of the challenges you face in making this intranet transition and a plan for helping you overcome them. Otherwise, it's just Sturm und Drang. After all, what does it really mean to be the Official Balun Maker of the Intranet Revolution?

Hey, maybe we ought to do something to keep these vendors honest. How about making them contribute to a worthy cause of our own? Say, a rest home for network managers worn out before their time?

John Gallant, editor in chief jgallant@nww.com

Teletoons

By Phil Frank and Joe Troise
baba@sfgate.com



THE BLUE VIEW

The outlook for token-ring users is not all doom and gloom

It is not surprising that token-ring users are feeling increasingly jittery and isolated. All of the media and industry attention seems to be focused on Fast Ethernet, gigabit Ethernet and the perennial favorite, ATM. But the good news for the token-ring community is that they still have more options than have been widely talked about, including token-ring switches.

Anura Gurugé

It's true that Ethernet and Fast Ethernet switching solutions probably outnumber token-ring switches by 30-to-1, and that the per-port cost of an Ethernet switch is less than a third of the typical token-ring switch. However, token-ring switching, after a slow start, is now a well-established and proven technology.

In fact, recent product releases signal the next phase of token-ring switching is at hand. These include Asynchronous Transfer Mode and FDDI uplinks from vendors such as Bay Networks, Inc. and Nashoba Networks, Inc., and the emergence of token-ring switching modules from IBM and Xylan Corp. with translational bridging functions to enable switching between token-ring and Ethernet or Fast Ethernet networks.

Using an ATM backbone at the campus level, in conjunction with token-ring switching at the segment and workgroup level, will in most cases prove to be the first decisive step toward a wide-scale migration to ATM.

The uplinks and the ability to interwork with Fast Ethernet switching have the potential to enable token-ring users to eradicate throughput affecting backbone and backbone-attached LAN server bottlenecks, contain networking costs and pave a fairly smooth migration path to the promised land of ATM.

There are now multiple ways to obviate token-ring backbone bottlenecks by enhancing the bandwidth available to the backbone and, even more importantly, to the LAN servers attached to the backbone. Using the uplinks, token-ring switches can act as very low-latency bridges between token-ring LANs and either FDDI or 155M bit/sec ATM backbones.

The switching hubs open up 100M bit/sec Fast Ethernet as yet another backbone option. In addition, products scheduled to be released later this year will enable LAN servers with $250 25M bit/sec ATM adapters to act as high-throughput backbone servers to token-ring clients. Using an ATM backbone at the campus level, in conjunction with token-ring switching at the segment and workgroup level, will in most cases prove to be the first decisive step toward a wide-scale migration to ATM.

The ability to interoperate with Ethernet and Fast Ethernet switching also provides a potential solution for cost containment. Ethernet solutions have been consistently less expensive than comparable token-ring offerings. Fast Ethernet switches and adapters, though providing at least three to four times the useful bandwidth of token ring, tend to cost about the same as token-ring switches.

Now that it is possible to run SNA/Advanced Peer-to-Peer Network and even High Performance Routing (HPR) across Ethernet without any major impediments, the lower cost of Ethernet solutions has become a siren call to many administrators of token-ring networks..

There is, however, one important caveat for users considering Fast Ethernet simply as a means for upgrading backbone LAN servers to 100M bit/sec. Both Ethernet and Fast Ethernet can only support frame sizes of up to 1,500 bytes. Token ring and FDDI, on the other hand, can deal with frames that are 4K bytes or longer. If large volumes of data must be transferred between the Fast Ethernet servers and token-ring clients, Fast Ethernet's 1,500-byte frame size can become a throughput handicap.

If all-out performance is the primary goal, 100M bit/sec FDDI, though more expensive, is likely to deliver a higher throughput, since it, like token ring, is capable of transferring data in large frames. FDDI's performance edge is, however, only germane when dealing with Fast Ethernet servers operating in half-duplex mode. If it is possible to have full-duplex servers on dedicated switched ports serving token-ring clients, the added bandwidth of full-duplex operation will, in the long term, compensate for the smaller frame size.

With IBM, and now Fore Systems, Inc., aggressively promoting cut-price solutions, 25M bit/sec ATM is the other cost-effective alternative for users that want their LAN servers to operate beyond the 32M bit/sec full-duplex limit possible with switched token ring. Currently, achieving interoperability between token-ring switches and 25M bit/sec ATM switches is somewhat cumbersome and costly, and likely to involve three separate boxes. This situation is expected to change by October, when IBM and other vendors are set to release products that will support both token-ring and 25M bit/sec ATM switching.

The ultimate solution would be to have a single switch, whose ports would be able to support, in autosensing mode, both token-ring and 25M bit/sec ATM. Whitetree Technologies, Inc. currently offers a switch with ports capable of supporting both Ethernet and 25M bit/sec ATM; several vendors are working on a token-ring version.

Token ring, though it has suffered some erosion of late, will continue to be a significant presence for a very long time to come. Over the next four years, token-ring switches with FDDI, Fast Ethernet and ATM internetworking will provide the high-bandwidth backbones token-ring users seek. So despite what they may see in the media, token-ring users can rest a bit easier knowing that they will still have many attractive options available to them.

Gurugé is an independent consultant specializing in internetworking and IBM network architectures. He can be reached at (603) 878-1303 or via the Internet at aguruge@mcimail.com. His new book Reengineering IBM Networks *is available this month from John Wiley & Sons.*

ENTERPRISE OUTLOOK

VLANS are here to stay

John McConnell

The maturing switching market has been marked by consolidation and vendor differentiation on management and virtual LAN strategies. There are different opinions about the strategic value of VLANs or, for that matter, what a VLAN is. While some argue that VLANs are relatively unimportant and of no lasting value, the reality is that widespread incorporation of LAN switching makes the emergence of VLANs inevitable.

What we are doing is reinventing the same structures we encountered in the evolution of the Internet and intranets — and thereby, reintroducing the same problems we encountered then, as well.

It's no secret that most LAN switches are fast multiport bridges — fast silicon and smart software make the difference between a current LAN switch and a traditional bridge. Reinventing the bridged network introduces the familiar issues of scalability, broadcast interference and spanning tree management to control data flow.

Large bridged networks literally mandated the creation of routers as a way to deal with these problems. The tide shifted rapidly from bridged to router-based nets as routers grew more sophisticated and performance improved. But while routers did separate and contain traffic from different broadcast domains, they introduced a new problem — management complexity.

Will large switched (bridged) fabrics mandate a VLAN? Routers could be used in exactly the same old way: to isolate broadcast domains contained within the switches attached to each router interface. However, delivering bandwidth is only one problem users face.

Other major challenges include dealing with complexity, rates of change (in growth, moves, bandwidth demands and so on), cost of ownership, management staff effectiveness and impact on the bottom line.

Recreating the traditional broadcast domain doesn't address these management issues. Switches deliver full LAN bandwidth to a single system attached to a port. This granularity gives us new options for solving both management and bandwidth problems.

VLANs are broadcast domains with fluid boundaries that are determined by management software rather than router interfaces. Workgroups are organized to support fluid project structures. VLAN members can share resources without having to move to the same physical LAN segment; VLANs can track the movements of systems and automatically move their privileges and memberships wherever they attach.

In addition, many network configuration tasks are simplified, and policy-based management allows better control of the network for business activities.

VLAN methodologies combine what we already know works with the options switching offers. As usual, the devil is in the details. All VLANs are not the same — different membership criteria (for example, by switch port, media access control layer or network layer address, or application activity) and routing approaches have varied properties and effects on performance.

VLAN methodologies combine what we already know works with the options switching offers.

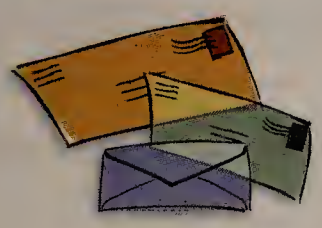
VLANs are still maturing; some vendors have rudimentary offerings, while others have rolled out enhancements at a faster pace. There are still issues that need to be resolved, including the ways in which VLANs are defined, performance management, management policies, spanning multiple technologies and interoperability.

The bottom line is: Are you going to throw out the solutions to a substantial set of management problems because the concepts haven't yet been clearly articulated? We know that large switched fabrics are going to have significant limitations. The functionality that network administrators and designers need is in the combination of switching hardware and powerful management software.

Keep your eye on the functionality VLANs offer and insist your vendors explain their VLAN strategies clearly. Follow early implementations and determine for yourself how "real" VLANs are.

McConnell is president of McConnell Consulting, Inc., in Boulder, Colo. He can be reached via the Internet at johnmc@mcconnell.com.

MESSAGE QUEUE



Feeling reassured

I appreciated Kevin Tolly's column "Recent reports of ATM's death are greatly exaggerated" (May 27, page 44). It is difficult for some of us non-engineers to figure out the correct path for our networking environments.

I recently directed my school system, comprising 25 schools over a 25-mile radius, to build a wide-area network using black fiber and IBM switches with ATM uplinks. In our environment, we need the ability to use audio, video, graphics and data. ATM is the only solution that will accommodate all of these standards without major complications.

Not being an engineer (only an educator with some technical knowledge), I can only hope that I don't regret this decision next year. Tolly's comments have given me a little comfort.

Chuck Browning
Technology coordinator
Columbia County Schools
Appling, Ga.

Author, author

After reading your OS/2 Warp Server review (June 10, page 53) and recognizing who wrote it, I questioned the objectivity of the whole article — especially the high rating. After all, the author, Esther Schindler, has long been known as an OS/2 advocate.

Such influential reviews should be written by people who don't favor one product over another. By the same token, I would be disqualified from writing a review of Windows NT, since that is my primary development/installation platform.

In the future, consider more neutral writers for your reviews.

Christopher Waters
Systems engineer
SBM Computers & Communications Corp.
Easton, Pa.

Regarding your review of OS/2 Warp Server: I was impressed by the way the author was willing to praise Warp Server's strengths, while not ignoring those areas that need improvement. Congratulations to Esther Schindler on a well-written review.

And thank you, *Network World*, for providing the coverage of OS/2 that is often lacking in other industry publications.

John Ratti
Technology consultant
Jacksonville, Fla.

Quiz gets A+

Edwin Mier's column "A quick quiz to determine your LAN switch IQ" (June 3, page 37) is the best example of wit used in an important point I have seen in the trade press.

Mier could have piled on the sarcasm even heavier — there is so much buzzword baloney about switching it sickens me.

Earl McCoy
Chicago

Your network bottlenecks are caused by garden-variety Ethernet adapters hogging processor power.

What you need are Ethernet adapters smart enough to get more throughput on every utilization without sucking the life out of CPUs. Or that can give full-duplex performance and increase bandwidth by a factor of 8. And guess what? We just created them. And if we tell you these little beauties only require 4K of conventional DOS memory, whereas other adapters gobble up 80K for device drivers and LAN protocols, imagine the DOS and Windows® applications you could load into memory without affecting your network performance. It's enough to give you goose bumps. And the best news of all is the low price of these little gems. You may also be surprised if you've sneaked a peek at our logo. Because yes, this is IBM, and no, we're not talking Token Ring. For more surprises, visit our Web site at www.raleigh.ibm.com/netad.html or call us at 1 800 IBM-2468*, ext. DA125, and get up to speed.

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Comparing LAN switch contenders:

BEYOND PERFORMANCE

Price / performance won't work as the key evaluation metric for Ethernet switches, but here are five other categories by which you can judge the players.

LARRY GOODE

By Kevin Tolly

When it comes to core internetworking devices, price/performance has traditionally served as the basis for most buying decisions. If only it were that easy with LAN switches.

Months of testing vendors' switches has given rise to one firm conclusion: The combination of mature Ethernet technology and lightweight business applications that are unable to stress the network has made price/performance almost devoid of meaning.

With traditional collision problems eliminated and Fast Ethernet fat pipes removing the server bottleneck, most switches will result in nearly identical throughput in typical corporate environments. Traditional frames-per-second tests typically show flat, near-wire-speed results for all switches. In fact, differences in performance are so subtle that some testers resort to designing tests of extreme conditions (such as massive congestion on all ports) to come up with results that allegedly differentiate products. This approach, of course, is misleading to users and potentially damaging to vendors.

So with raw performance nearly out of the equation, what criteria should you use to evaluate LAN switches? Well, after testing more than a dozen switches over several months, The Tolly Group has identified more than 100 points of comparison.

As the primary thrust of our study, we've endeavored to identify, categorize and explain these areas. To help you simplify the selection process, we've grouped the criteria into five main areas.

Architecture

Fundamental to every switch is a set of low-level design choices that affect almost every other aspect of the product. Since there is no industry standard for switches, it is not surprising that significant differences abound. Even products sporting the same vendor logo will often be built upon different architectural approaches because one or more of the products entered the fold as a result of a company acquisition.

Not surprisingly, vendors stress switch architecture as a primary basis for product selection. And, on paper at least, the differences are easy to cite. Unfortunately, empirically proving the benefit of arcane and often subtle differences is quite difficult. Furthermore, showing that these differences translate into measurable benefits in real-world scenarios is even more difficult.

Often, the architectural issues are best considered in terms of future requirements. That is, the architecture of the switch may have little or no impact on your initial, limited implementation of switching, but may promote or restrict your ability to, say, support multiple Asynchronous Transfer Mode links at a later date.

Forwarding type

Getting a disproportionately large share of the attention when it comes to architecture is cut-through vs. store-and-forward switching. Cut-through accelerates the processing of frames by beginning the transmission on the destination LAN before the entire frame arrives on the input. Store and forward works just like a traditional LAN bridge: The frame forwarding begins only after the entire frame arrives in the input buffer.

Vendor hype notwithstanding, there is very little evidence that one or the other mode offers significant benefits to actual end-user performance. This is not to say that one cannot show that cut-through latency — meaning the time it takes to move the frame out onto the destination LAN — is decidedly shorter; it is. But translating that per-frame benefit into measurable end-user response-time improvements has yet to be done. (This is one of the areas that will later be explored in the performance evaluation phase of The Tolly Group study.)

Switch matrix

As each frame crosses the fabric of the switch, it either travels as a complete unit or, a la ATM, is cut up into cells prior to forwarding and reassembled at the output port. The designers of the products evaluated to date are overwhelmingly for the frame-switching model. In fact, of the vendors evaluated, only Ornet Data Communications Technologies employs a cell-switching approach.

While cell switching no doubt brings ATM to mind, it should be noted that Ornet has chosen eight bytes as its cell size rather than the 53-byte cell size employed in ATM products. The Centillion switch, a prominent switch not evaluated in this study, does employ native ATM cell switching as its LAN switch backplane strategy.

To date, no empirical data has been produced to prove conclusively that there are any fundamental trade-offs between frame-based and cell-based approaches. It does stand to reason, however, that backplanes based on pure ATM would likely offer an easier upgrade path to that technology.

Another architectural consideration is where the actual switching matrix is placed. 3Com Corp. (Lanplex 6000), Fore Systems, Inc., IBM, Ornet and Xylan Corp.

distribute the switching function to the port modules. Fore even has multiple switching components per module — one for every two ports. To these vendors, distributed switching is a key to building scalable products. The remaining vendors implement a centralized switching matrix. Here again, we have been unable to detect any difference in terms of functionality that can be attributed to where the switching matrix is located.

As we move deeper into the switch architecture, we approach areas where direct comparisons are difficult and perhaps inappropriate to make. Application Specific Integrated Circuits (ASIC), by definition proprietary, are at the heart of each switch. Comparisons among ASIC designs go beyond the scope of this study.

Vendors rate their own backplane capacity, ranging from UB Networks, Inc.'s 72M bit/sec to the 3Com Lanplex 6000's 19.5G bit/sec, with all other products falling into the 360M to 1.2G bit/sec range. Since it is unlikely that, in the real world, any switch would be required to handle wire-speed traffic on all input ports, differences in rated backplane capacity might prove to be much less critical than you first might think.

Flow control

The individual product strategies are more varied when it comes to flow control than anywhere else. Buffers can be static or dynamic, assigned to input or output queues, and be shared across multiple ports or modules. Since memory is tangible and carries a significant cost, disparities in per-port prices might often have their root in buffer strategies.

Switches meant primarily to serve one or just a few users can understandably get by with less buffer memory than those designed to be at the core of a large switched network.

Insufficient buffering could result in degraded performance as the attached networks become busier. Yet outfitting a switch with excessive memory is simply a waste of money. Unless you are buying a switch to place at the focal point of your campus network, don't be overly concerned about buffering since it is unlikely that individual stations will generate significant loading on your switch.

Backpressure is another scheme used to provide flow control. Employed only by the 3Com SuperStack (formerly known as LinkSwitch) and the Ornet switch in this group, this involves the switch actively jamming the input port to prevent end-stations from transmitting traffic into the switch. Unfortunately, the entire input LAN is jammed, thus, potentially degrading the performance of stations whose traffic is not destined to traverse the switch. Ornet, however, only jams the port if traffic is destined for the switch.

Physical and logical connectivity

In stark contrast to the often vague and intangible attributes of architecture, the realm of physical connectivity is clear and straightforward. In fact, the offerings are so varied that an easy way to move closer to finalizing your own shortlist is to cross-check your physical connectivity requirements with those offered by the various products (see graphic, page 43).

Since switches are, after all, really just bridges, logical connectivity should likewise be straightforward. But that is hardly the case. In order to conserve bandwidth, implement security and respond to network anomalies, vendors have implemented various schemes to enhance the logical connectivity of their switches.

Protocol support

Basic bridging is a given, and all products except those from UB and Fore support the 802.1d Spanning Tree Algorithm. As a fundamental aspect of bridging, you need to be concerned about table depth; that is, how many individual media access control (MAC) addresses or Ethernet stations can be handled over a single port. If a switch can only handle a small number of stations per port — say 25 or less — it is designated as a workgroup or desktop device, depending on vendor terminology.

Of the products we examined, only the Fore switch and the 3Com SuperStack belong to the desktop-only category, with table depths of four and roughly 25 per-port (average), respectively. The other products indicate either no per-port limitation or, in the case of IBM and Xylan, 1,790 per-port and 1,024 per 12-port module, respectively. As far as maximum MAC addresses per switch, most of the products fall into the range of 1,000 to 16,000. Ornet claims support for 524,000 MAC addresses. This we did not verify.

Note that memory and processing requirements for handling very deep MAC tables will likely raise the per-port price. But for switches handling a large number of concentrated segments, per-port MAC table depth in the thousands is a likely requirement.

Early on, the ability for a switch to implement full Layer 3 routing appeared quite important. For the most part, virtual LANs have eclipsed traditional routing as the most important advanced feature of LANs. Of the products evaluated, only 3Com (Lanplex series), Asante Technologies, Inc.'s 5216xp and the Xylan OmniSwitch offer traditional routing of IP, IPX and AppleTalk.

VLANs

We need to create a new category for VLANs — let's call it "mirageware." From a distance it appears to exist, but up close, it disappears.

About the 1996 Ethernet Switching Study

As this story makes clear, the issues you face when making LAN switch purchase decisions go well beyond raw performance. In an effort to provide you with comprehensive data upon which to base your decisions, The Tolly Group has created a new model for the investigation of Ethernet switches.

The model was formulated after testing 17 Ethernet switches from 12 vendors. (A few more have been tested since this story went to press, hence the higher number than what you see here). Invitations to participate in the testing were sent to all providers of Ethernet switches. The participating vendors funded this project.

The 200-plus-page electronic report containing the results of this study are available worldwide at no charge. This hands-on buyer's guide will be updated during the remainder of 1996 as additional products are evaluated.

Furthermore, vendors were invited to submit a response to two requests for proposal formulated by The Tolly Group for Ethernet switching equipment; one for workgroup connectivity and the other for backbone connectivity. The vendor's responses, including equipment pricing, service costs and network management, are included in the report.

You can access this information at The Tolly Group Web site. Access via Network World Fusion by selecting NetRef, Technology Resources then Internetworking.

ETHERNET SWITCHES Pricing for core 10M and 100M bit/sec support

Vendor	Product	Switched 10M bit/sec support: Per-port price with switch fully loaded	Switched 10M bit/sec support: Number of 10M bit/sec ports in basic increment	Switched 10M bit/sec support: Maximum 10M bit/sec ports per switch	Switched 100M bit/sec support: Number of 100M bit/sec ports in basic increment	Switched 100M bit/sec support: Maximum 100M bit/sec ports per switch	Switched 100M bit/sec support: Cost for basic 100M bit/sec increment	Additional per-port cost of 100M bit/sec port (chassis price not included)	Number of 10M bit/sec ports displaced by basic 100M bit/sec increment	Switched 100M bit/sec backbone support (8 or more 100M bit/sec ports): Per-port price with switch full loaded (chassis included)	Switched 100M bit/sec backbone support (8 or more 100M bit/sec ports): Warranty included with purchase price
Primarily fixed-port switch											
3Com	SuperStack II Switch 1000	$199 (1)	24	24	1	2	$0	$0	0	NA	1 year
Asante	Asante 5216 switch	$311 (1)	16	16	2	2	$0	$0	0	NA	3 years
Cabletron	SmartSwitch 10/100	$571	14	14	1	2	$425	$425	0	NA	90 days
Cisco	Catalyst 2100	$185 (1)	25	25	2	2	$0	$0	0	NA	90 days
IBM	8271 Nways Ethernet LAN Switch Model 108	$417	4 or 8 (2)	12	1	1	$1,300	$1,300	4	NA	1 year
UB Networks	GeoRim/Edt	$200	16	16	1	1	$1,000	$1,000	0	NA	1 year
Modular switch											
3Com	LANplex 2500	$731	8	16	1	2	$1,495	$1,495	0	NA	1 year
3Com (3)	LANplex 6000	$1,402	16	48	8	24	$7,995	$999	16	$1,554	1 year
Asante	Asante 5216xp Switch	$419	16	16	1	2	$795	$795	16	NA	3 years
Cisco	Catalyst 5000	$541	24	96	12	50	$9,995	$833	24	$1,073	90 days
Fore	ES-3810 Ethernet Workgroup Switch	$219	24	72	2	6	$1,095	$548	0	NA	1 yr. hardware, 90 days software
Xylan	OmniSwitch	$643	12	48	8	32	$8,950	$1,119	12	$1,402	1 yr. hardware, 3 mon. software
Ornet (4)	LANbooster 5000	$497	12	48	1	4	$6,857	$6,857	12	NA	1 year
HP (5)	AdvanceStack Switch 2000	$396	4	24	2	12	$1,249	$625	4	$791	3 years on-site

(1) Base per-port price includes vendor's basic increment of 100Mbit/sec support.
(2) The IBM 8271 Model 108 has 8 fixed ports and an option slot that accommodates an additional 4 ports. With no option card, the basic increment is 4 ports; with the option card, the basic increment is 8 ports (another chassis).
(3) The Tolly Group evaluated the 5-slot version of the LANplex 6000. Calculations for the 9-slot version may yield lower per-port prices.
(4) 100M bit/sec support is FDDI.
(5) 100M bit/sec support is 100 VG-AnyLAN.

NA = Not applicable
All prices, provided by the vendors, are MSRP.
SOURCE: THE TOLLY GROUP

All of the vendors in this evaluation, save two, claim VLAN support today. The exceptions, Cabletron and UB, both plan to add VLAN capabilities.

Unfortunately, today's working definition of VLANs almost universally is "stations grouped by physical port or Layer 2 MAC address." That means VLANs are better at excluding stations than including stations. Unfortunately, what most network managers need is controlled inclusion. The capability of grouping stations in a more flexible manner is currently restricted to switches such as the 3Com Lanplex series, the two Asante products and the Xylan switch.

Be aware that implementing a primitive VLAN scheme may be worse than having no VLANs at all. For example, half of the products offering VLANs don't allow a station (like a server) to be part of more than one VLAN. That limits flexibility considerably.

Worse, perhaps, is the lack of internal VLAN-to-VLAN connectivity. Most of today's implementations create little islands of connectivity within the switch requiring external routers if traffic is to flow between VLANs. This is a costly and complex solution. Only Asante, Xylan and 3Com (Lanplex series) claim internal VLAN-to-VLAN capabilities.

Fault tolerance

As switches begin to move closer to the center of the network, reliability becomes ever more important. If one can classify switches as low-end and high-end, it is the switch loaded with fault-tolerant features that can rightly be termed high-end.

One such feature is hot-swappable components. For the most part, hot-swapping is simply not applicable to units that are primarily fixed-port. For the modular devices, hot-swapping might apply to connectivity media, power, uplinks and fans. The Cisco Systems, Inc. Catalyst 5000 supports hot-swapping in all of those areas. Close behind are the modular products from 3Com (Lanplex series), Asante, Ornet and Xylan that provide hot-swapping in at least two of the aforementioned areas. The other key element of fault tolerance is redundancy. And the most important areas for redundancy are management processor, port backup, power and fans.

Expect power redundancy from all but the lowest end box. Note whether the redundant power is load sharing (better) or load shifting. Also, it is useful to be able to run two different power cords to the same power supply.

3Com, Ornet and Xylan allow you to assign one port to back up another. This can be very useful for critical connections. And even though some vendors do not claim port redundancy, the Spanning Tree Algorithm supported by their products does allow for a sort of redundancy for bridged connections. Should the primary port fail, the Spanning Tree Algorithm activates the redundant port. Xylan switches, alone among the products evaluated, even provide for a redundant management processor.

Manageability

Management is a blend of standards-based and proprietary approaches. For initial configuration, expect to deal with an ASCII terminal-based proprietary setup routine. Diagnostics will likely be proprietary, as well. Standards-based management using Simple Network Management Protocol or Remote Monitoring (RMON) come into play primarily when monitoring of the device is required.

In terms of SNMP support, there is broad support for the essential Ethernet groups with virtually every vendor supporting the Ethernet MAU, Ethernet Interface, Bridge and MIB II objects. Most every vendor provides a proprietary Management Information Base (MIB), as well. And those that provide support for additional media, such as FDDI, also support the FDDI MIB.

Strategically, RMON is where you want to look for real-time performance and error statistics. This is eminently clear to the vendors. In this evaluation, 3Com (SuperStack), Asante, Cabletron Systems, Inc., Hewlett Packard Co., and Xylan already offer support for at least some of the nine groups. 3Com (Lanplex series), Cisco (Catalyst 5000), Fore and Ornet all stated their intentions to provide RMON support soon — it is likely to be standard on all but low-end boxes.

RMON support is usually implemented in three phases: the first four groups (Stats, History, Event and Alarms), the next four groups (Hosts, HostTopN, Matrix and Filter) and then capture. (The Hosts group provides statistics stored for each MAC address. HostTopN ranks stations based on traffic and error statistics. The Matrix group details the traffic matrix — who communicates with whom — and the Filter group allows the user to select specific packets.)

For obvious reasons, Capture is the most memory intensive; it is sure to drive up memory requirements and price. Of our group, 3Com (SuperStack) and Asante offer the most extensive RMON support, with Asante even claiming support for capture.

As valuable as SNMP and RMON management may be, there are times when you need to observe the actual traffic running across a port. Mirror ports are ports that can be configured to "see" the traffic running across some other specified port (or ports) in the box. Without such a port, low-level (i.e., Sniffer-level) diagnostics are not possible. In our group, some support for port-mirroring is almost universal, with 3Com (SuperStack) and Xylan being the only boxes without it. Xylan plans to add this capability soon.

Some boxes designate specific ports to be used for mirroring. HP, IBM, Ornet and UB fall into this category. In most cases, this port can also be used for regular traffic when not needed for mirroring.

Very useful is the capability of configuring a single mirror port to monitor multiple switch ports. 3Com (Lanplex series), Asante, Cabletron, Cisco, Fore and HP all allow this.

Price

There is probably no area where vendors are more sensitive than price. Unfortunately, pricing is a very complex issue and inappropriate oversimplification can produce misleading results. Our pricing graphic on page 40 is an attempt to provide some insight into the per-port cost of boxes for core 10M and 100M bit/sec connectivity.

When referencing this graphic, don't forget that there are many factors (outlined throughout this article) that have an effect on the per-port price. Furthermore, all prices are list prices. Since products are distributed via different channels, the final end-user price will vary. If you are ready to buy, you should get the current street price from your supplier and run your own calculations. Note that the devices are grouped by chassis type.

The "Switched 10M bit/sec support" column shows the optimal per-port price if the box we evaluated was loaded with the highest density cards we had. Note that the 3Com SuperStack, Asante 5216 and the Cisco Catalyst 2100 include Fast Ethernet uplinks in the base price. 3Com and Asante include one, while Cisco includes two. The "basic increment" in the table indicates the basic port grouping offered by the product. This helps the buyer understand where the steps exist in product expansion.

Since most network managers want to take advantage of some Fast Ethernet connections, we indicate the cost for adding the first group of 100M bit/sec support and what that group is. For primarily fixed devices, that number is always one or two and usually maxes out at two. For chassis devices, Fast Ethernet support may come in modules holding eight or 12 ports.

Note also that when you add 100M bit/sec ports to chassis-based products, you typically must remove a card supporting 10M bit/sec ports.

How we did it

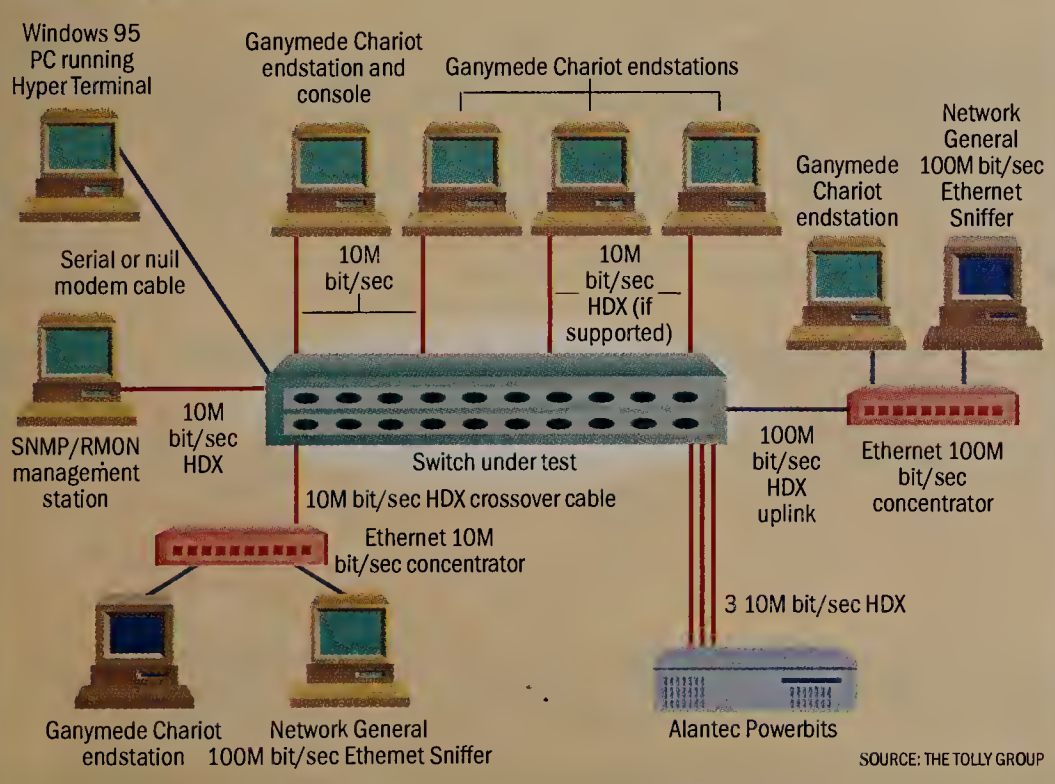
To test each switch, we connected it to a live network consisting of 10M and 100M bit/sec concentrators, various network management platforms, analyzers and high-performance endstations. We then checked the switch for more than 100 attributes and ran a few application-based performance tests using Ganymede Software's Chariot test suite.

We devised a suite of minitests that would verify such features as basic virtual LAN support, management, Remote Monitoring and mirror port configuration. We yanked a few live modules and power supplies to test how effective the swappable components were.

We used a Wandel and Goltermann DA-30 to generate a barrage of broadcast frames to tax the switches' broadcast reduction algorithms. Live sessions were created with the Chariot endstations to look at the segmented VLANs and a Network General Sniffer decoded Routing Information Protocol fields to prove internal routers could "see" the VLANs we constructed. To look at management and configuration, we used the vendor's proprietary platform. If one was not available, we used a combination of PCs running an ASCII terminal emulator, Chameleon Open TCP/IP and HP OpenView.

After weeks of prototyping and research, we are continuing to refine our performance test suite. In addition to the obligatory frame per second test of 10M/10M and 10M/100M bit/sec performance using Alantec Corp. Powerbits, we are using Ganymede Chariot in various multiclient/multiserver scenarios to investigate how the switches perform in the real world — meaning what happens to applications when packets are dropped, for example. Since Chariot runs on a variety of operating systems, we are able to use standard 10M/100M and full-duplex adapter cards. We are also using an Alantec Powerbits generator/analyzer for such tests as head-of-line blocking and backpressure tests.

ETHERNET SWITCH TEST BED



SOURCE: THE TOLLY GROUP

To simplify the calculation, we do not include any portion of the chassis price here, only the incremental cost of the 100M bit/sec ports.

Finally, for devices that will be at the core of a complex network, you'll want to know the cost, per port, of outfitting the entire switch. Our pricing table lists the maximum number of 100M bit/sec ports per switch (this usually involves removing all of the 10M bit/sec ports) as well the price per port. This examination of various switch criteria has made at least one thing clear: It's time to take a structured approach to evaluating switch attributes other than performance, one that takes into account your specific requirements.

Our advice would be to concentrate on those aspects of products that provide tangible benefits, such as varied uplink support, RMON and/or mirror ports, and low price. Concentrating too much on areas such as matrix placement and switch fabric type or buffering mechanism will likely only confuse matters since it may prove impossible to determine any specific benefits of the different approaches.

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When performance doesn't cut it: Other ways to compare Ethernet switches

Vendor		3Com	3Com	3Com	Asante	Asante	Cabletron	Cisco	Cisco	Fore Systems	HP	IBM	Ornet	UB Networks	Xylan
Product		LANplex 2500	LANplex 5000	SuperStack II Switch 1000	Asante 5216 Switch	Asante 5216xp Switch	SmartSwitch 10/100	Catalyst 2100	Catalyst 5000	ES-3810 Ethernet Workgroup Switch	AdvanceStack Switch 2000	8271 Nways Ethernet LAN Switch	LANbooster 5000	GeoRim/Edt	OmniSwitch
Code rev		7.0.0	7.0.0	2.0	1.5	1.5	1.00.08	3.65	1.5	1.7	A.01.01	9.11	2.136	1.01A	2.0.4
Architecture	Forwarding type	Store and forward	Store and forward	Adaptive cut-through; long-look ahead optional	Adaptive cut-through; long-look ahead	Adaptive cut-through; long-look ahead	Store and forward	Cut-through; long-look ahead or store and forward	Store and forward	Store and forward	Store and forward	Adaptive cut-through; long-look ahead optional	Cut-through; long-look ahead optional	Store and forward	Store and forward
	Switch capacity	290M bit/sec	19.5G bit/sec	800M bit/sec	360M bit/sec	360M bit/sec	640M bit/sec	1G bit/sec	1.2G bit/sec	640M bit/sec	1G bit/sec	512M bit/sec	800M bit/sec backplane (1.6G bit/sec in Q1 97)	72M bit/sec	640M bit/sec
Physical connectivity	Chassis type	Modular	Modular	Fixed with option slot	Fixed	Fixed with 2 option slots	Fixed with 2 option slots	Fixed	Modular	Modular	Modular	Fixed with option slot	Modular	Fixed	Modular
	Capacities:														
	• Usable slots	4	3	N/A	N/A	2	N/A	N/A	4	4	6	1	4	N/A	4
	• Max 10M bit ports/switch	16	48	24	16	16	14	25	96	72	24	12	48 (96-Q2 97)	16	48
	• Max 10M bit ports/module	8	16	N/A	N/A	N/A	N/A	N/A	24	24	4	N/A	12 (24-Q2 97)	N/A	12
	• Max 100M bit ports/switch	2	24	2	2	2	2	2	50	6	12 (100VG-AnyLAN)	1	4 (FDDI)	1	32
	10M bit support	10Base-T, -2, -5, -FL	10Base-T, -2, -5, -FL	10Base-T, -2, -5, -FL, HDX	10Base-T, FDX	10Base-T, FDX	10Base-T, FDX	10Base-T, -5	10 Base-T, -FL, RJ-21, FDX	10 Base-T, (-FL planned) FDX	10 Base-T, -5, (-FL planned) FDX	10 Base-T, -5, -FL, FDX	10 Base-T, -2, -5, -FL, FDX	10 Base-T	10 Base-T, -2, -5, -FL, STP, (FDX planned Q3 96)
	100M bit support	100Base-TX, -FX, FDX	100Base-TX, -FX, FDX	100Base-TX, -FX, FDX	100Base-TX, -FX, FDX, autosense	100Base-TX, -FX, FDX, autosense	100Base-TX, -FX, FDX, autosense	100Base-TX, FDX	100Base-TX, -FX, FDX, autosense	100Base-TX, -FX, FDX,	N/A	100Base-TX, -FX, FDX,	N/A	100Base-TX, (-FX planned)	100Base-TX
	Uplinks	Fast Ethernet, FDDI, CDDI; OC-3 ATM planned Q3 96	Fast Ethernet, FDDI, CDDI; OC-3 ATM planned Q3 96	Fast Ethernet; OC-3 ATM planned Q4 96	Fast Ethernet, FDDI; CDDI, planned Q4 96, OC-3 ATM planned Q1 97	Fast Ethernet, FDDI; CDDI, planned Q4 96, OC-3 ATM planned Q1 97	Fast Ethernet	Fast Ethernet	Fast Ethernet, FDDI, CDDI, OC-3 ATM w/LANE	Fast Ethernet, OC-3 ATM w/LANE	100VG-AnyLAN; OC-3 ATM planned Q1 97	Fast Ethernet, FDDI, CDDI; OC-3 ATM planned	Fast Ethernet planned Q3 96; FDDI, OC-3 ATM planned Q4 96	Fast Ethernet	Fast Ethernet, FDDI, CDDI, OC-3 ATM w/LANE
Logical connectivity	Protocol support	AppleTalk, IP & IPX routing, transparent bridging with spanning tree	AppleTalk, IP & IPX routing, transparent bridging with spanning tree	Transparent bridging with spanning tree	Transparent bridging with spanning tree	AppleTalk, IP & IPX routing, transparent bridging with spanning tree	Routing planned Q3 96, transparent bridging with spanning tree	Transparent bridging with spanning tree	Transparent bridging with spanning tree	Transparent bridging	Transparent bridging with spanning tree	Transparent bridging with spanning tree	Transparent bridging with spanning tree	Transparent bridging	IP & IPX routing, transparent bridging with spanning tree
	MAC table entries	8,192	25,576	500	1,024	4,096	8,192	1,024 (2,048 and 8,192 with upgrade)	More than 16,000	288	10,000	10,000	524,000	16,000	9,000
	VLANs	Defined by port, MAC, Layer 3+ address and user-defined filter. Single station allowed in multiple VLANs. VLANs span switches.	Defined by port, MAC, Layer 3+ address and user-defined filter. Single station allowed in multiple VLANs. VLANs span switches.	Defined by MAC address. Single station allowed in multiple VLANs.	Defined by port, MAC, Layer 3+ address. Single station allowed in multiple VLANs. VLANs span switches.	Defined by port, MAC, Layer 3+ address. Single station allowed in multiple VLANs. VLANs span switches.	Planned Q3 96	Defined by port. Single station allowed in multiple VLANs. VLANs span switches.	Defined by port. Single station allowed in multiple VLANs through ATM. VLANs span switches.	Defined by port. VLANs span switches.	Defined by port	Defined by port	Planned Q4 96	Planned	Defined by port, MAC, Layer 3+ address and user-defined filter. Single station allowed in multiple VLANs. VLANs span switches.
	Broadcast reduction	Broadcast, Multicast, unknown MAC, frame discard, threshold specified by packets/sec	Broadcast, Multicast, unknown MAC, frame discard, threshold specified by packets/sec	Broadcast, unknown MAC, input port block, threshold specified by % port speed	None	None	Broadcast, Multicast, unknown MAC, frame discard, threshold specified by packets/sec	Forward unknown MAC to designated port	Forward unknown MAC to designated port	Forward unknown MAC to designated port	Broadcast, Multicast, unknown MAC, frame discard, threshold specified by % port speed	None	None	Broadcast, frame discard, threshold specified by packets/sec	Broadcast, Multicast, unknown MAC, input port block, threshold specified by % port speed
Fault tolerance	Hot-swappability	Connectivity media, uplinks	Connectivity media, uplinks	None	None	Connectivity media, uplinks	None	None	Connectivity media, uplinks, power, fans	None	Connectivity media	None	Connectivity media, uplinks	None	Connectivity media, uplinks, power
	Redundancy	Load-balancing power	Load-balancing power	Load-balancing power (via external supply)	Load-balancing power (via external supply)	Load-balancing power (via external supply)	Fans	None	Load-balancing power, dual power cords to single power supply, fans	Power planned Q4 96	Load-balancing power, fans	Fans	Management module, load-balancing power	None	Management module, load-balancing power, fans
Manageability	RMON	Planned Q3 96	Planned Q3 96	Stats per port, all other groups memory dependent (no filter or capture)	9 groups, all ports simultaneous	9 groups, all ports simultaneous	9 groups, 4 simultaneous ports	None	Planned	Planned Q3 96	4 groups, 4 simultaneous ports	None	Planned Q4 96	None	4 groups, all ports simultaneous
	Mirror port	Multiple definable ports mirror multiple ports	Multiple definable ports mirror multiple ports	None	Multiple definable ports mirror multiple ports	Multiple definable ports mirror multiple ports	Multiple definable ports mirror multiple ports	Single definable port mirrors multiple ports	Single definable port mirrors multiple ports	Multiple definable ports mirror multiple ports	Designated mirror port mirrors single port	Designated mirror port mirrors single port	Designated mirror port mirrors single port	Designated mirror port mirrors single port	Planned

N/A = Not Applicable Note: The preceding are preliminary study results. Not all features/functions verified by press time. Please refer to the full report for final results.

Source: 1996, The Tolly Group

Management Strategies

Covering: Career Insights and Innovations in Managing Staff, Budgets and Technology

Briefs

■ **Kansmen Corp.** *is shipping* **ISDN Accountant 1.0,** *a Windows application that can help you control ISDN costs.*

The software collects data from ISDN routers connected to the Internet and can generate alerts when connection time is excessive or when router problems and configuration errors occur. The $300 package requires an 80386-based PC running Windows 3.0 and communicates with a Simple Network Management Protocol-based ISDN router.

Kansmen: (408) 263-9881.

■ **Novell, Inc.'s Education** *division officially announced its* **Internet Manager** *certification program.*

To earn the certification, users must complete six courses and pass five examinations. Four courses focus on Internet topics, while two address NetWare issues. Two Internet courses — Understanding and Applying Internet Concepts, and Web Publishing and Authoring — are available now.

Web Manager and Advanced Web Manager courses are scheduled for this fall. The NetWare courses are NetWare 4 Administration and NetWare TCP/IP Transport. Two of the exams are available now while the rest will come out this fall.

Novell Education: (800) 233-3382.

Plan now to reap NYNEX/Bell Atlantic merger benefits

By Melodie Reagan

NYNEX Corp. customers, get ready. You stand to benefit the most once the merger between your local carrier and Bell Atlantic Corp. is completed by early next year.

You can stay on top of merger developments online. Visit Network World Fusion, select Careers from the main menu, then click on Bell Atlantic/NYNEX merger.
Network World Fusion
http://www.nwfusion.com

If you start planning today, you'll be ready to capitalize on Bell Atlantic's more solid customer service and partake of some of the niceties that Bell Atlantic customers have enjoyed for a while: ISDN just about anywhere in its territory, ubiquitous Advanced Intelligent Network (AIN)-based services and accelerated deployment of Asymmetric Digital Subscriber Lines (ADSL).

There are any number of things you can do to prepare yourself. These range from having technology assessment teams evaluate the Bell Atlantic offerings not yet available from NYNEX to keeping tabs on your NYNEX representative for the latest merger news. These tips will work for managers affected by other local carrier mergers, too (see graphic).

Pay close attention to how customer service will change. Generally speaking, the one thing the regional Bells have held sacred is quality of service; the public commissions require it. However, NYNEX was fined last year in New York for not meeting the public utilities commission's customer service requirements. So you can expect the new Bell Atlantic will improve service and support.

And although NYNEX may disagree, Bell Atlantic has been far more proactive and successful in its product launches. Indeed, Bell Atlantic was among the first RBOCs to offer widespread deployment of digital switching and AIN. It has been a leader in new technologies such as ADSL and Switched Multimegabit Data Service, and it has displayed a willingness to push the regulatory envelope for applications such as video on demand.

So get acquainted with Bell Atlantic's advanced services and send out a scouting team to see what's in development.

Why? Bell Atlantic's capable product development will no doubt spill over into NYNEX territory.

Bell Atlantic is promising to pump $5.5 billion annually into the combined region's network. This money will align the two RBOCs' service networks and integrate systems to cut back office costs. The benefit to you will be more consistent service delivery processes and greater latitude for the combined firm when setting pricing.

Will all this be done overnight? Of course not. Although you may be able to get your hands on some timetables, the reality of merging networks and business systems will defy deadlines. Product development will probably be a slow process simply because of the requisite decision-making.

For instance, the firms must decide on what information systems to keep, what organizational structures make the most sense and what business processes are best. There's also a legal wrinkle: They can plan, but until the deal is complete, they can't act — at least not jointly.

Similarly, you should do your planning now, but temper your implementation of new services. Get confirmation that any new service is being — or soon will be — offered by both companies, albeit separately until the merger is complete.

Having said all that, it will behoove you to be aware of issues that have riled some Bell Atlantic customers. Many complain that ISDN costs too much. Others are a little tired of Bell Atlantic taking so long to provide message-waiting indicator devices for its voice mail service.

At the same time, realize NYNEX will bring a lot to the table, too. NYNEX was the first RBOC to roll out an intra-local access and transport area virtual network service and multirate ISDN.

Plus, NYNEX has international coverage, as evidenced by its operation of the second largest cable-telephony network in the U.K.

But where it counts most — in the products that are available and working and the service that customers receive — Bell Atlantic is going to have a substantial and positive impact in the NYNEX territory.

You just have to be ready to reap the benefits.

Reagan is a director at TeleChoice, Inc., a Verona, N.J. consultancy specializing in strategic planning and market research. She can be reached at mreagan@telechoice.com.

Merger preparation for NYNEX customers

Here's how you can prepare to take advantage of Bell Atlantic's more advanced services once the two companies complete their merger early next year.

- ▶ Build a technology assessment team to evaluate existing Bell Atlantic offerings.
- ▶ If you already subscribe to Bell Atlantic, evaluate which services you'd like to use throughout the Northeast and share that evaluation with your NYNEX representative.
- ▶ Examine existing Bell Atlantic tariffs so you can begin to plan your budget. As you do, keep in mind that with competition entering the local arena, it's safe to assume prices will decrease for core services such as business lines, ISDN, Centrex and PBX trunks.
- ▶ Evaluate how your operations staff will need to adapt when you have one provider for services from Maine to Virginia.
- ▶ Contact your NYNEX representative to learn what services are being planned and when they will be available.

SOURCE: TELECHOICE, VERONA, N.J.

Package promises improved service contract management

By Kathy Scott

A Windows-based program designed to help you better manage external service contracts is currently in beta test and scheduled to ship later this month.

Everest Software Corp.'s Outsourcing Management package runs on Windows NT or Windows 95 and is designed to help you more quickly spot when extra costs are creeping into an outsourcing contract, when inadequate service levels and measurements crop up, and when to make contract adjustments due to new technology implementation.

The package's drag-and-drop graphical user interface enables you to create a complete representation of the contract on screen. An information repository can store all notations about contract activity. In addition, an allocation capability enables you to charge back costs to a department or process. Those costs, along with key contractual commitments and billing, can be tightly monitored.

"All of those things, I think, are really critical to understanding how much the outsourcing service is doing for you and what the value of extending it is," says Sue Aldrich, senior consultant and editor at Patricia Seybold Group, Inc. in Boston. One of the selling points of the package is that it can be used to track any type of outsourcing deal, whether it be for help desk services, network management, training, software development or even cleaning the office, Aldrich says.

A unique component of the software is the ability to monitor company activity for things such as contracts, equipment and personnel. This is a plus, Aldrich says, because it guides the user into creating documentation that can provide a historical perspective no matter how often there is a change in who manages the outsourcing contract.

David Horaeck, a manager at Coopers & Lybrand and a beta user, says the product offers robust contract monitoring and flexibility. He says his company is convinced this type of software is rare but is a necessity for managing contractual obligations.

The new software was ported from a Unix version and can run on any size server that also runs Borland International, Inc.'s InterBase database. The cost is $30,000 for three users and $10,000 for each additional user. Discounts are available for more than five users.

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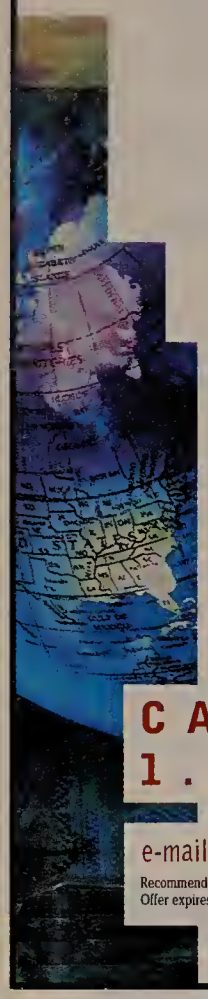
FDDI/CDDI RMON LAN Monitor



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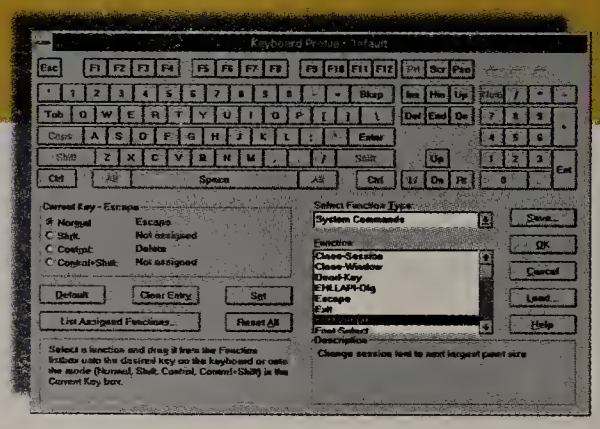

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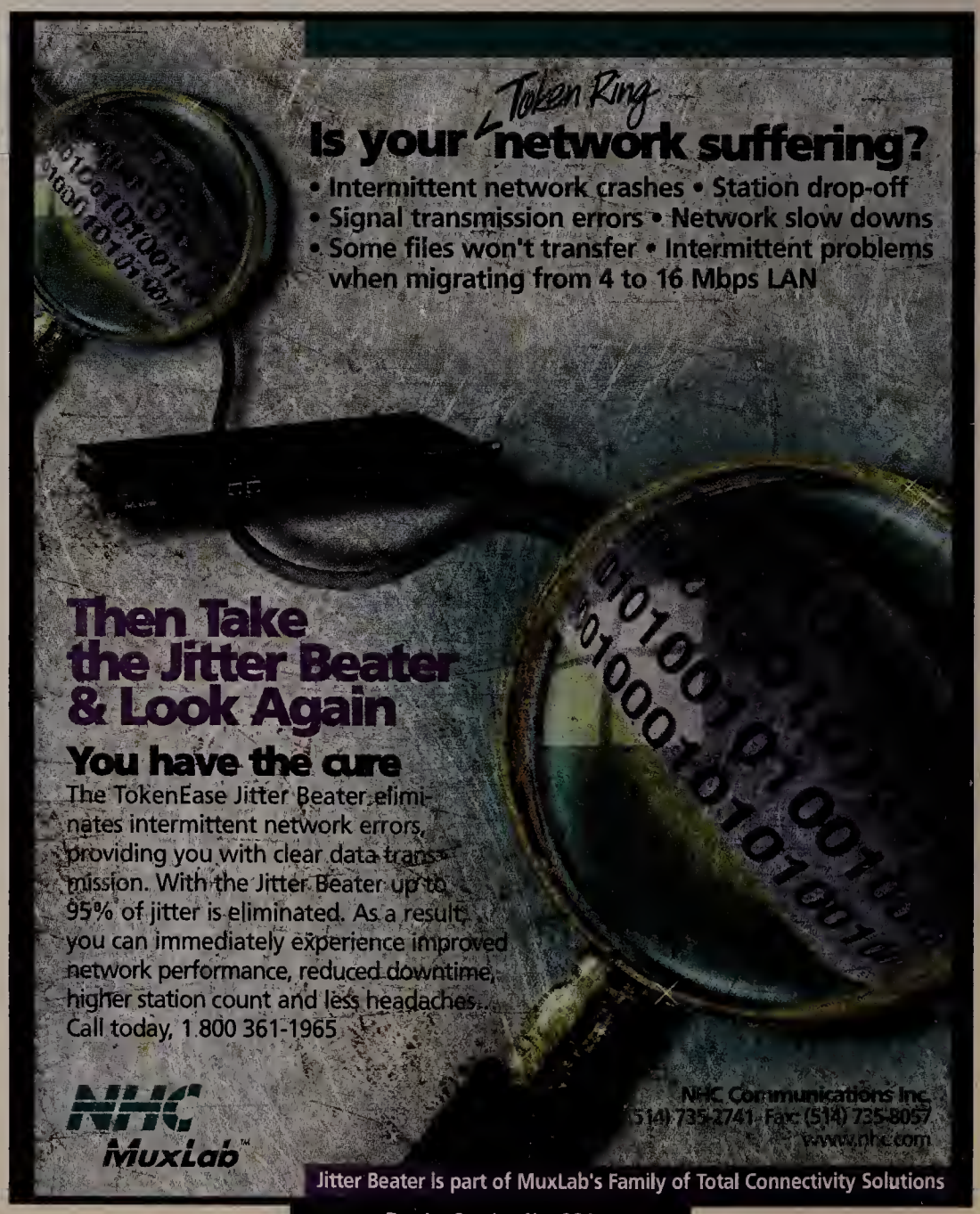

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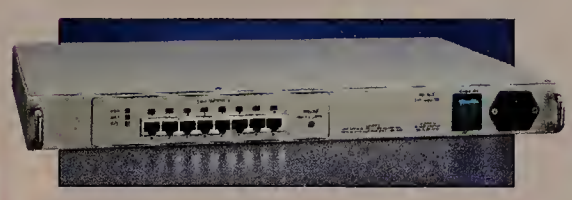

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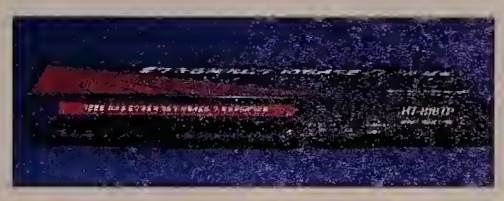

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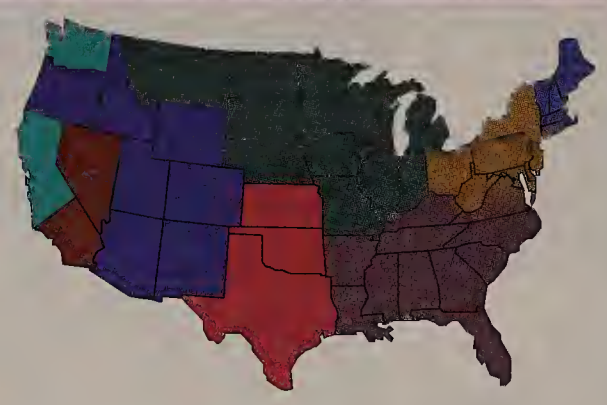

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DIRECTORY OF SERVICES

Vo-tech

Continued from page 1

Whatever form it takes, it's the hands-on training that sets vocational school students apart from other entry-level job candidates.

"Someone with a college degree often has never seen the inside of a computer, but can program in 15 different languages," says Nigel Pickering, microcomputer manager at the Bank of Oklahoma. "What we want is someone who knows the guts of a server and understands the instruction sets to use."

Pickering found that and more last year when he hired Jerry Howland. A graduate of Francis Tuttle's two-year Certified NetWare Administrator (CNA) program, Howland routinely worked with NetWare while maintaining the campus network and explored other net technologies in lab experiments. Now he spends his time at the bank terminating cable, installing servers, adding new users to the network and performing router and gateway management, among other tasks.

"Employers want someone who is a technician as well as an administrator," Howland says. "You've got to demonstrate that you can wear more than one hat; they don't want specialists anymore."

Francis Tuttle's CNA program, like the one at Eastern Montgomery County Vocational Technical School, just north of Philadelphia, provides students with a stepping-stone to a Certified Novell Engineer certificate. Indeed, many vocational schools tend to build their network programs around NetWare, although a few are starting to look toward Microsoft Corp.'s Windows NT Server.

LANDING THE BIG ONE

About 75% of the students who graduate from Great Oaks Institute's Electronics program directly enter the labor market, while the other 25% pursue associate's degrees. Job placement for Francis Tuttle Vo-Tech graduates is 95% within one year.

Students at Francis Tuttle receive 70 hours of network training. In addition to the NetWare focus, the curriculum calls for heavy doses of education in operating systems, such as Windows and DOS, and in applications courses. Moreover, upon entering the school, students are assigned to the MIS department for hands-on training.

At Eastern Montgomery Vocational, students who enroll this fall in the school's new CNA program will earn 13 credits toward a local college's CNE associate program.

"They'll become a CNA and go to work immediately, with the option of continuing their education to earn the CNE certificate in college part-time while they work," says Dr. Joseph Colaneri, director of Eastern Montgomery Vocational in Willow Grove, Pa.

Students are already helping gut and rebuild the school's network, installing Category 3, 4 and 5 fiber cable, and helping install an electrical system to support a new server farm.

Once classes start, students face a two-year training stint of 180 days per year.

In addition to the traditional courses such as English and history, three hours each day are spent in classes on topics such as computer science, C programming, network applications, advanced DOS, LAN administration and support, and systems analysis and design.

The pace is even more demanding for students who enroll in apprenticeship programs. At Great Oaks Institute, apprenticeships are offered as carrots to successful students, says Cliff Migal, executive vice president and chief operating officer. Students start with a shadowing experience in which they spend several weeks learning in the field — without pay.

Once students master their core curriculum, they may join a cooperative youth apprenticeship, most of which are paid. The program starts in the summer between 10th and 11th grades, and students put in 3,500 hours over the next two years — with about 50% to 60% of their time at a corporate site. Before the apprenticeship ends, students may log as many as 8,000 hours.

"They get no summer or Christmas breaks," Migal says. "When you commit to apprenticeship, you are committing to a full-time job."

Corporate training

Such programs require cooperation between the schools and area businesses, as do programs whereby the schools provide training for existing corporate network staffers.

Gene Callahan, superintendent of Tulsa Technology Center in Oklahoma says his school trains upwards of 15,000 adults every year and is expanding its networking focus.

"You've got to learn the needs of the community," Callahan says. Businesses can't afford to have workers miss five days for training, so the school has learned to package courses in small doses and make training largely self-guided so that students can use software-based courseware to bone up on required topics.

Vocational school training has caught on with private industry, Callahan says, because it offers high-quality instruction for much less cost than private consultant courses. "We compete against $1,800 courses but charge only about $200," he says. "Now that's your tax dollars at work." Vocational schools are often subsidized by tax dollars, which helps lower training costs, he says.

But Francis Tuttle's Carol Snider Farris thinks there's another reason why vocational school training is catching on. "Keep in mind that our mission is to provide more hands-on training versus other training sources that teach theory," Snider Farris says. "Maybe IS buys into our philosophy of learning through doing." ■

Tivoli

Continued from page 1

tively distribute software and detect problems.

These same sources also said Tivoli will unveil AMS support for another IBM offering — Lotus Development Corp.'s Notes — later this year. This scheme will let users manage the Notes application environment from the TME 10 management platform, possibly weaning them from the existing Hewlett-Packard Co.-based Notes:View manager.

Tivoli hopes to mold its AMS API, which is based on the Desktop Management Task Force's Desktop Management Interface, into an industry standard for application management. The ultimate goal with Powerbuilder or any AMS applications, analysts said, is to integrate them with TME 10 so they can be part of an enterprise-level management package.

TME 10 is the systems and network management package that melds existing TME functions with IBM's SystemView offerings.

The result should be a single, mainframe-to-desktop package that will simplify the management of large distributed enterprises.

The Tivoli Manager for Powerbuilder includes the AMS API and will work with Powerbuilder 5.0-based applications. A generic API is also expected that would allow older Powerbuilder applications to be visible to the Tivoli Manager.

The package contains a Tivoli Developer Kit for Powerbuilder and Tivoli Manager For Applications.

The developer kit includes APIs that enable users to build ties to the application manager, which in turn monitor software performance levels and enable features such as software distribution. The application manager can support 500 users. Powerbuilder is designed to build large, distributed client/server applications.

ARMed AND DANGEROUS

Not to be confused with AMS, Tivoli and HP last month announced plans for another API called Application Response Measurement (ARM). It is designed to help customers measure the end-to-end response time of a network application.

The package will be available later this summer for $6,000 to $25,000, depending on how many nodes are being managed.

Although Tivoli confirmed the impending announcement, it would not provide any details.

Prepackaged servers coming

The Powerbuilder announcement will follow on the heels of the introduction of two new prepackaged management servers from Tivoli.

TME 10 NetFinity Server for OS/2, Version 4.0, and TME 10 Management Server for AIX, Version 4, are part of the IBM Software Server family that integrates a variety of previously disparate products into one manageable package.

The packages add little new to the existing IBM and Tivoli products, but they do represent the first releases of the combined IBM/Tivoli technologies.

TME 10 NetFinity Server for OS/2 is targeted at managing small workgroups and features the ability to manage Windows, Windows 95, Windows NT and NetWare clients. It performs several management functions, such as gathering attached workstation hardware and software inventories.

The release also adds support for IBM's NetView Distribution Manager, which lets the server distribute software to remote locations and receive software updates from a central mainframe-based NVDM. NetFinity had no mainframe connectivity options in the past.

TME 10 Management Server for AIX performs the same functions in the Unix environment.

"This announcement was an indication to users that IBM and Tivoli will integrate their products and make them work, rather than giving lip service," according to Richard Ptak, director of systems management research at the D.H. Brown Associates, Inc. consultancy in Port Chester, N.Y.

TME 10 NetFinity Server is available for $799 per server and $49 per management client. TME 10 Management Server starts at $2,000 per server and $75 per client.

✆Tivoli: (512) 794-9070.

COMMENTS?

See "How to reach us" on page 6.

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Sun and Gibbs aim for world domination through English language

Sun Microsystems is a company I have always admired. It started small, and through a combination of immense creativity, innovative thinking and dynamic marketing, it became one of the most amazing companies in a market that has more remarkable corporations than a pomegranate has seeds.

But Sun had a problem. The threat of the accursed Wintel world weighed heavily upon it. Worse still, SPARC was looking pretty pricey and Solaris was getting long in the tooth. Sun's PR equity was fading.

And then along came Java. Java looks like it will become one of the greatest accidental successes in the history of computing.

Starting out rather uninspiringly as the operating system (code-named Oak) for a controller device that was ultimately abandoned, the Java system became the right product in the right place at the right time with the right name. By all rights, they should have called it Serendipity.

Mark Gibbs

Java has revitalized Sun. The company again has something hot to talk about. Overnight—well, perhaps not overnight, but pretty quick—a whole new market arose. And with a name like Java, the third-party market has had a paronomastic field day. We have had Latte, Espresso and numerous other word plays too bad to recount. Sun has undergone a PR renaissance. Its steak has regained its sizzle.

But recently someone at Sun corporate must have blown a brain fuse. Over a skinny double cappuccino with a twist, one of the suits must have suddenly realized they were on to a "good thing." Now, rarely in one's career does one stumble onto a really "good thing," and if you are a suit, control of the "good thing" is what you try to achieve.

Thus, it became known a couple of weeks ago that Sun was out to own the word Java. I don't mean own as in trademark or sales mark. Oh no. It seems to want the whole ball of wax. It has been legally leaning on companies such as Javac (a private site promoting Java) and Javanco (an electronic parts supplier) to cease and desist using any domain name with Java in it (*NW*, June 17, page 1). And with Sun's financial resources, many companies will simply do as they are told.

Starting out as the OS for a controller device, the Java system became the right product at the right time with the right name.

Now this is an interesting ploy. Here at the Gibbs Center for World Domination Studies, we realized immediately how great an opportunity it would be if Sun were to take this all the way to the courts and win. Just think, if some demented court should uphold Sun's position, the possibilities would be endless. Jumping on that bandwagon could pay off.

For instance, we would try to grab "Gibbs" as soon as possible and enforce our ownership of it in all forms. This would inconvenience, among others, established firms like Gibbs & Associates and Gibbs International. We would, of course, be willing to license use of the word.

We would also be going for "Mark." This, we expect, will be our really "good thing." No longer will "X marks the spot" be tolerated. In the future, it will be "X indicates the spot." No more "magic marker." Without a license, it will have to be "magic pen." And you can forget the use of "trademark." Well, that is unless you're willing to cough up some bucks.

After that, we plan to go for the individual letters M, A, R, K, G, I, B and S. Oh, and E, O, U and Y (just because they are used so much). Perhaps we'll try for all articles and adjectives after that and then make a bid for the entire language.

Oh, Sun, Sun, Sun. What have you started?

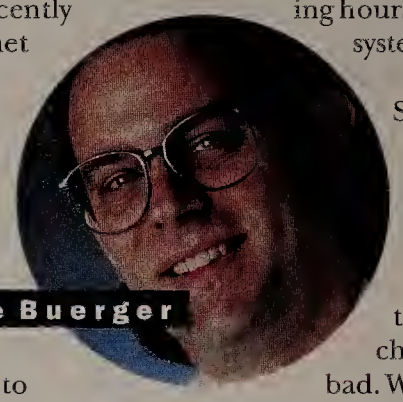
Does it sound to you like the lights are on but no one is home at Sun? Let Gibbs know your deepest, darkest thoughts at mgibbs@gibbs.com or call him at (800) 622-1108, Ext. 504.

Internet domain registration needs refinement, not excuses

Homer Simpson once told his infamous son the three keys to a successful life. He advised Bart to use any of these lines if caught perpetrating mischief:

- "You didn't see me do it."
- "The other guy did it."
- "It was like that when I got here."

Homer's advice has always worked for me—at least until I was recently accused of being an Internet deadbeat.



Dave Buerger

This not-so-subtle hint arrived via U.S. mail in a dunning notice from Network Solutions, Inc. (NSI), which processes Internet domain registrations for the InterNIC. NSI threatened to cancel my buerger.com domain name for failure to pay the $100 registration fee.

My first reaction was panic. Losing one's Internet ID is unthinkable in today's wired world. It's like suffering the fate of felonious ancient Egyptians whose names were erased from all records, snuffing out their existence.

Losing one's Internet ID is unthinkable in today's wired world.

"Oh, God, why me?" I cried.

Actually, I said, "What bill?" The dunning letter claimed NSI had E-mailed a final notice to our domain's administrative, technical and billing contacts. That bureaucracy comprises myself and my wife, Maggie—and neither of us had ever seen a bill from NSI.

So we called NSI to figure out what happened. It only took a day's worth of calling to break through the busy signal. According to what I've heard on the street, we got through quickly.

The lady who answered took our credit card information. We asked for a confirmation number, but she didn't have one. "I have to walk this to another department, and they put it on the computer."

Her supervisor blamed our Internet service provider for submitting the wrong information. ("The other guy did it.") He said we could call back to confirm payment.

Last week, I learned that 75,000 other deadbeats had received the same letter. Did they all maliciously avoid paying their bill? Doubtful. The 'Net has been abuzz with complaints of bungled registrations and the NSI E-mailing ISPs instead of domain name holders.

So who's to blame? David M. Graves, Internet business manager at NSI, is avoiding accusing the ISPs. He said NSI is reacting to the surge in domain registrations by ramping-up operations, extending hours and upgrading its phone system.

But is this enough? Should Internet users have to jump through all these hoops just to register and maintain their names? The short answer is no.

Some blame may rest with the ISPs, but we can always change carriers if service gets bad. We cannot switch from NSI because it's the sole registration contractor to the National Science Foundation. That means NSI needs to professionalize its act and pick up the slack.

NSI certainly has the bucks to do the job right. Profitwise, Graves said, he believes the organization is just about breaking even. The math suggests it's much better than that.

About 225,000 domains were registered this year, according to Mike Walsh, a market researcher and 'Net consultant in Falls Church, Va. Almost 25,000 were added during the two weeks ending June 21. That reflects nearly $22.5 million in revenue, more than that claimed by new Internet companies worth billions!

Obviously, NSI can't bank the whole wad. Some revenue goes to its parent, Science Applications International Corp., a private $2.2 billion government contractor. Another 30% goes to a special fund earmarked for Internet infrastructure improvements. And it still needs to collect from 30% of the nonpaying domain name registrants.

NSI also claims heavy expenses in hardware and software infrastructure to support registration. But surely it can't be that onerous. For instance, its six T-1 lines must cost a whopping $50K a year.

NSI deserves credit for keeping up with most domain registration growth, but the time for excuses is past. Executives have enough hassles without having to waste time on domain registration snafus. Perhaps cash-in-advance registrations might help to end nasty surprises.

Buerger is a networking industry consultant and writer in Atlanta. He can be reached (this week) at dave@buerger.com.

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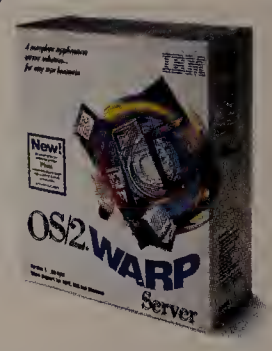
"Running OS/2 Warp Server on a network is like feeding it steroids.

This thing really hummmmms."



Network

Josh Airall always keeps his antenna up for new ways to enhance his network. His job as Systems Analyst for Cincinnati Bell Information Systems demands it.

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